

3. A new declaration is attached.
4. Several editorial corrections have been made in the specification, including updating the missing patent number.
5. As the request of the examiner, without introducing new material, the applicant provides step by step tutoring in the specification to adequately teach (1) how to make the invention; (2) how to use the invention (3) function of device; (4) how the device operate (5) the described structure; (6) how it is manufactured; (7) how it functions; (8) what each part intended to do; (9) particularly point out and distinctly claim the subject matter which applicant regards as the invention

Golh is the breakthrough in sport technology worth of patent. It is no wonder the examiner has so many questions. To answer the above examiner's questions, the inventor has to give the step by step tutorial without introducing new material.

[How to use the invention; How the device operate]:

FIG1, FIG.2, FIG.3, FIG.4, FIG.5, FIG.6, FIG.7, FIG.15, FIG.16, FIG.17, FIG.18, FIG.19, FIG.20, FIG.21, FIG.22, FIG.23

[Function of Device; How it functions]

FIG.8, FIG.9, FIG.10, FIG.11, FIG.12, FIG.13, FIG.14, FIG.15, FIG.16, FIG.17, FIG.18, FIG.19, FIG.20, FIG.21, FIG.22, FIG.23

[What each part intended to do]

FIG.10, FIG.11

[How to make the invention; how it is manufactured]

FIG.42, FIG.43, FIG.44, FIG.45, FIG.46, FIG.47, FIG.48

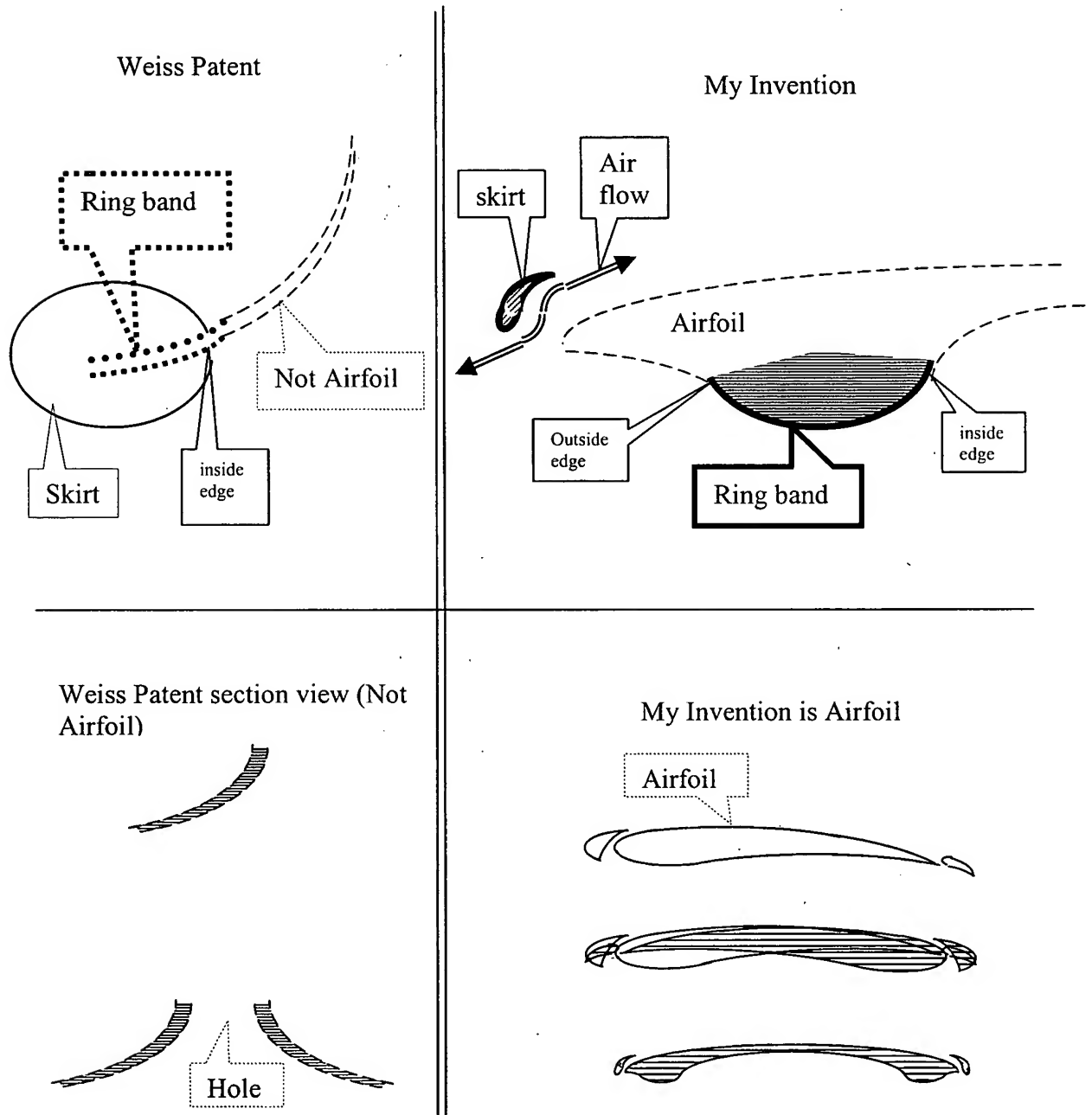
6. The claims of record have all been rewritten and replaced with new claims 21 to 40 in order to define the invention more particularly over the cited reference. There claims are all submitted to be patentable over the cited references because (1) they recite novel structure and thus distinguish physically over every reference(Sec. 102) and (2) the physical distinctions effect new and unexpected results, thereby indicating that the physical distinction and unobvious under Sec. 103.

The Claims All Distinguish Over The Reference Under Sec.102

6. The independent claims, and hence all claims, distinguish over the reference under Sec.102 because they recite a golh sport which swivels club to launch golfrisbee to fly and play as the golf sport does.

7. The cited and relied-upon Weiss' patent shows ring band only for edge protection, not for the aerodynamic lift.

In the office action letter, the examiner said "Weiss discloses a circular Frisbee, a ring band at the rim of said Frisbee, said ring having a smooth transitional curve to the outside and inside edge." "Weiss discloses a skirt made of soft material" "The middle portion of Weiss would act as an airfoil".



[Ring Band] The Weiss' ring band is different form my ring band.

The Weiss' ring band is at the extreme outside of the disk. So it has only the inside edge. It doesn't have the outside edge needing to make the smooth transition curve. Since it is symmetrical at both upside and lower side, the ring band doesn't produce aerodynamic lift force.

Furthermore, the Weiss' skirt wraps around the ring band. It has no aerodynamic function at all! It is to protect the player of the sharp edge that the skirt is completely enwrapped with the skirt. The ring band doesn't exposed air. On the contrary, they induce a lot of drag force.

My ring band is located close to edge but in the middle and at the bottom of the disk. It is to produce aerodynamic lift force. It is exposed to the air.  
My ring band is not to protect the player from the sharp edge.

So, the Weiss's ring band is completely different from my ring band.

The skirt of my invention having the slot between the skirt and the disk boy. The slot and the skirt need to guide the air flowing over the disk and the air flowing downward out of the disk.

[Skirt] The Weiss' skirt band is different form my skirt.

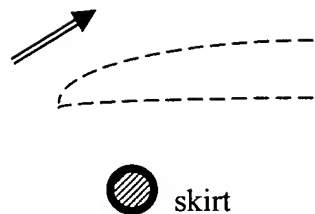
In Weiss' patent there is no slot at all. The skirt of the Weiss' patent is only to protect the sharp edge from the player. So the skirt of Weiss' patent is completely different from the skirt of my invention.

[Airfoil] The Weiss' patent is different form my airfoil.

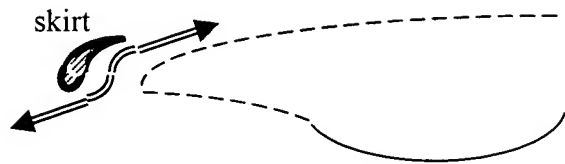
In the air dynamics, the airfoil has the special means. The airfoil means the special design cross section of the wing of the airplane. The Weiss' cross section is not the airfoil at all. No airplane can fly with the wing of the Weiss' patent. The wing of my invention is derived from the wing of the airplane. The wing of my invention is airfoil.

8. The cited and relied-upon Manes' patent shows the skirt only to capture the disk, not for the aerodynamic lift, not for the aerodynamic stability, not for the edge protection, either.

In the office action letter, the examiner said "Manes discloses a golfrisbee, a circular skirt attached with small stubs."



Manes, Patent



My Invention

The skirt of the Manes is below the disk. It is only to capture with the stick in the missing disk situation. It will not protect the sharp edge of the disk. It will not guide the air flowing up the disk as the slot slat does. It will not guide the air flowing downward as the slot flap does. It will not provide the side stability as the empennage of tail assembly does.

The skirt of my invention is at the exterior edge and above the disk. It will protect the sharp edge of the disk. It guides the air flowing up the disk as the slot slat does to increase the aerodynamic lift and reduce the drag. It guides the air on the disk to flow downward as the slot flap does to increase the aerodynamic lift and reduce the drag. It provides the side stability as the empennage of tail assembly does.

So, the skirt of my invention is completely different from the skirt of Manes' invention.

9. Claim 7 is rejected as being unpatentable over Weiss as applied to claim 1 and further in view of Wilson et al. Employed the weight of Wilson et al with the device of Weiss. Weiss does not disclose a hole.

However, the Weiss does have a hole. Even modifying Weiss patent to include as taught by Wilson et al, it still cannot make the combination.

Furthermore, the Wilson et al's patent is not one flying disk. It actually two flying disks. It will separate to be two flying disks as shown in FIG.1 and FIG.2 in Wilson et al's patent. So, it is impossible to combine one of the disks of Wilson et al's two disks with the Weiss patent which has a hole in the middle of disk.



So, to combine Wilson et al's patent with Weiss patent correctly, it is too much work to make one. Definitely, it is not obvious combination of the Wilson et al's patent and Weiss patent.

8. Claims 5,8 and 9 is rejected to have modified the disk of Weiss to include a central hole, light and sound means.

Weiss' patent actually has a big hole. It is impossible to add the light and sound means to the center of Weiss' patent!

You cannot negate the system level design and innovation with component.

9. The other cited but not relied-upon patents are also deficient in one or more of the above-discussed physical features of the independent claims.

The central hole dimension must match the size of disk and the height of skirt. Otherwise, the flying disk will lose the side stability and turn over falling to ground.

The light and sound means weight must be balanced with the dynamic lift. The light and sound means cited in the office action are too bulky and too heavy. Instead of traveling farther, they will make the 1500 ft throwing range golfrisbee disk to be less than 100 ft throwing range.

It is not obvious to one of ordinary skill in the art to modify the disk of Weiss to include a central hole and light and sound means. They will destroy the performance of golfrisbee disk completely.

10. Since the independent claims both cite swiveling club launching disk to fly and universal direction wing features to have ultra long range hybrid golfrisbee and golfball capability which are not present in any reference, applicant submits that these claims, and hence all of the dependent claims, clearly recite novel physical features which distinguish over any and all references under Sec. 102.

The Novel Physical Features Of The Claims Provide New And Unexpected Results And Hence Should Be Considered Unobvious, Making The Claims Patentable Under Sec.103.

11. Specifically, since the **swiveling club launching universal directional wing flying disk has the ultra-long range flying capability (about 1500 feet)**, it has the practical application to many sports, especially to the golf sport to replace the golf ball with the golfrisbee.

12. None of the prior-art closures can provide these new and unexpected results::

My invention is the only sport which can throw the flying disk – universal directional wing golfrisbee up to 1500feet.

13. Since the above novel physical features of applicant's device provide these new and unexpected results over any references, applicant submits that these new results indicate unobviousness and hence patentability. According applicant respectfully requests reconsideration and allowance of the present application with the above new claims.

#### Additional Reasons Militate In Favor Of Unobviousness

14. In addition to the above new and unexpected results, applicant submits that additional reasons in favor of patentability, as follows:
15. Unrecognized Problem: Up to now, insofar as applicant is aware, the art contained no indication of the desirability of providing the **swiveling club disk golf and the aerodynamic design flying disk**, are submitted to be important one, worthy of patent protection.
16. Crowded Art: The present invention is in a crowded art (note all of the references on which are cited in the introductory portion of the present specification). It is well recognized that in a crowded art, even a small step forward is worthy of patent protection. While the present invention of **swiveling club disk golf and the aerodynamic design flying disk** is submitted to be far more than a small one, nevertheless this factor militates in applicant's favor.
17. Long-Felt But Unsolved Need: The present invention solves a long-existing but unsolved need and therefore is submitted to be worthy of patent protection. Specifically, although **"hand-throwing" disk golf** have been proposed or in use for many years, they had numerous inherent disadvantages, as stated in the prior-art section of the present specification. Users suffered from the inability to have **"club-throwing" disk golf** capability. The present invention provides these features, thereby solving a long-felt need in this area.
18. Unsuggested Combination: The need for the prior art references themselves to suggest that they can be combined is well-known, E.g., as was stated in *In re Sernaker*, 217 U.S.P.1. 1,6(CAFC 1983):
- "(P)rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings."
19. The suggestion to combine the references should come from the prior art, rather than from applicant. As was forcefully stated in *Orthopedic Equipment C. Inc. v. United States*, 217 U.S.P.Q. 193, 199(CAFC 1983):

“ It is wrong to use the patent in suit[here the patent application] as a guide through the maze of prior art references, combine the right references in the right way to achieve the result of the claims in suit[here the claims at issue]. Monday morning quterbacking is quite improper when resolving the question of nonobviousness in a court of law [here the PTO].

20. In the present case, the rejection of certain claims uses the Weiss' patent, which relates to the **toy**, a field far removed from **golf sport– GOLH: Golf Hybrid**. There would be no reason for one skilled in the art to combine disparate reference such as and patent and either of the other relied-upon references. Abd there is no suggestion in the references themselves that they be combined. Thus applicant submits that any combination of Weiss' and Wilson's with the other references is an improper one, absent any showing in the references themselves that they can or should be combined.

### **The Dependent Claims are A-fortiori Patentable**

21. The dependent claims add additional novel features and thus are submitted to be, a-fortiori, patentable. The claims recite **golh sport** having **snow golh and night golh** capability. None of the references show this feature.

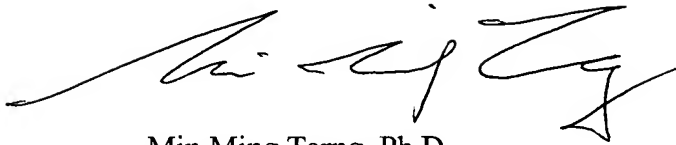
### **The Cited But Non-Applied References**

22. These subsidiary references have been studied, but are submitted to be less relevant than the relied upon references.

### **Request For Constructive Assistance**

22. The undersigned has made a diligent effort to amend the claim of this application so that they define novel **golh : swiveling club to launch universal directional wing flying disk, ring, boomerang, boomerang ringdisk and boomerang diskring, golfrisbee and golfball, etc** which is also submitted to render the claimed structure unobvious because it produces new and unexpected results( **the longest throwing range of record, up 1500ft** ). If, for any reason the claims of this application are not believed to be in full condition for allowance, applicant respectfully requests the constructive suggestion of the examiner in drafting one or more acceptable claims pursuant to MPEP 707.07(j) or in making constructive suggestions pursuant to MPEP 706.03(d) in order that this application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Very Respectfully,



Min Ming Tarng, Ph.D.  
Applicant Pro Se

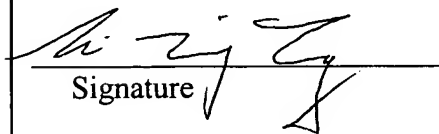
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Name of applicant



Signature

Oct.29, 2003  
Date



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Patent Application of

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for

**Golh: the Golf Hybrid Sport of Golfrisbee and Golfball**

**Background Field of Invention**

Golh sports are the century sports for the 21st century. Golh is the golf hybrid of disk and ball. As shown in FIG.1, the disk in golh sport is referred to be golfrisbee. The ball in golh sport is referred to be golfball. The golh, handisk, and basedisk, etc are the new sports derived from our inventions golfrisbee and golfball. Both golfrisbee and golfball are derived from the same club-swiveling throw art. The golfrisbee or golfball is thrown into the sky with the club swiveling. The golh sport comprises of a flying object being thrown to fly with a swivel of a club by hand. The golh club is swiveled with hands to rotate the flying object and throw the flying object to fly. The golh club is constituted of a pole and a head. The pole is swiveled with hands in a circle to throw

the flying object to fly. The club head is for the flying object to be pivotally mounted on it. The flying object is thrown out to rotate and fly. The golfrisbee throwing process is more like the sky-ballet. It looks beautiful just like the ballet dancer spinning on the stage. Therefore, we refer the golfrisbee to be the ballet in the sky. Our goal is to have the golh sports to be the Olympic sports. However, the golf is still not an Olympic sport yet. It is due to the original golf sport remaining as the sport for the rich people. Due to safety reason, the golfers need to book for the tee-time to play. The rate of the usability of the huge golf course is very low. No wonder the golfing fees are high. Golf becomes the sport for the rich people only.

To change the situation, the golfrisbee is introduced to make the revolution in the golf sport of modern society. Now, the golfrisbee has made the breakthrough in golh technology. It will make the golh sport to be the sport for the people, not for the rich. As shown in FIG.1, based on the innovation of the golfrisbee, many sports are created accordingly such as golh, golfrisbee, golfball, basedisc, handisc, basketdisc, tenndisc, waterdisc, etc. A lot of new associations are formed such as Golh Association, Golfrisbee Association, Basedisc Association, Handisc Association, Basketdisc Association, Waterdisc Association, etc as shown in the web site <http://www.golfrisbee.com>. In the future, since the handisc and ice golfrisbee will be the popular sport for people, golh have the potential to be the Olympic sport. Therefore, the golh will be the first Olympic sports of golf type sports.

As shown in FIG.1, golh is the hybrid golf sport made of flying golfrisbee, golfball and the rolling ball. Golfrisbee is to swivel club to launch flying disk to fly. Golfball is to swivel club to throw ball. In golh sport, the long drive adopts flying golfrisbee or golfball as shown in FIG.1; the

putting adopts the basket for disk or the hole for golfball as shown in FIG.7. The golfrisbee has the soft-landing essential characteristics which it can play in the park to be the park sport. Even playing in the golf course, multiple groups of golhers can play at the same place without safety concern. Multiple groups of golhers share the golf course price. Golh does not need the tee-time. It reduces the golf course expense a lot.

The golh sports can be further divided to be

- (1) Course Golh;
- (2) Park Golh;
- (3) Disk Golh;
- (4) Snow Golh;
- (5) Ski Golh;
- (6) Night Golh;
- (7) Long-Drive Golh;
- (8) Basedisc;
- (9) Other: such as Handisc, Ice Golfrisbee, Tennidisc, Basketdisc, Waterdisc, golh shooting, etc.

Golh can play in the golf course to be the course golh. There is the technology compatibility between the golfrisbee and golfball. Golh is the golf hybrid of disk and ball. In golf, the golf ball is hit with the swiveling golf club. In golh, the golfball is thrown with the swiveling golh club. For the course golh, there is no tee-time requirement for the golhers. The golher can play golh in the course any time and any place.

The high-flying golfball is dangerous. There is no golf in the park. However, the golfrisbee is safe, and then the golher can play golh in the public park. The golh played in the park is the park golh. Since the park golh and basedisk can play in the public park, the customer base for the park golh is huge.

As shown in FIG.1B, the basedisk is the conjugate sport of the baseball. Basedisc is to play golfrisbee according to the baseball game rules. The flying disk is the golfrisbee type basedisc launched with the golh club. The basedisc is smaller and heavier than golfrisbee. The basedisk flies as fast as the baseball.

Basedisk is the attacker swiveling the golfrisbee club to launch the disk to fly. The pitcher is no longer needed. The defenders catch the disk and pass the disk to touch the attacker. The rule is the same as the baseball. The flying disk for the golh and basedisk has innovations to fly long-range distance and is safe to operate.

As shown in FIG.1A and FIG.1B, to play the basedisc or golh in the park, we need to have the portable base or portable-putting hole. The golh system pack includes the universal portable putting base for both the basedisc and park golh.

The handisk is the conjugate sport of the football. The handisk is to play the golfrisbee according to the football game rules. The disk is launched to fly with the hand or golh club.



As shown in FIG.1A, the golh is to play the golfrisbee in the disc golf course according to the golf rules. On the disk golf course, there are many baskets 18. The basket 18 is corresponding to the hole in the golf course. Disk golfers throw the flying disk into the basket 18 with the hand. Instead of using hand throwing disk, the golhers use the golh club 2 to launch the golfrisbee 1 to fly. Disk golh is the golher launching the golfrisbee to fly into the basket directly with the golh club. The hand-throwing disk golfers are our potential golh customers.

One of the golh target accounts is the golf course. However, to make the golfers and the golf courses to accept the golh sport, we need to provide the complete golh system package for the golh market strategy. At the beginning, to approach the golf course, the golh market strategy is to take the market share which the golfer cannot play the long drive. There are the places and times which the golfers cannot play the long drive such as the park, snow course and the time in the night. The golh can play the long drive in the golf course during the darkness in the night. To differentiate from the golf having no long driving capability, we mention the new snow golf and the new night golf having the long drive capability with golfrisbee to be the park golh, snow golh and night golh. To make the golfers and golf courses accept the golh sport, we promote the night golh and snow golh. The night golh and snow golh can have the long drive with the flying golfrisbee and the putting with rolling golfball. The snow golh and night golh do not conflict with the existing golf sport activities. The snow golh and night golh can do the time sharing with golf for the same golf course.

Night golf is to play golf in the night. Night golf is the golf sport in the desert places. Why there is the need for the night golf? The first reason is that it is too hot to play golf during the

daytime for the cities in the desert such as Las Vegas. The golfer has to wait until the temperature being cooled down in night. The night golf is the only golf which can be played in the hot desert. The second reason is that, in the weekdays, after the business hour, it is already 6 p.m. It becomes dark. If the golfer wants to play golf in the weekday, the night golf is the only choice. However, it is difficult to find the long drive flying golf ball in the night. The night golf is limited to be putting only!

On the contrary, the snow golf and ski golf are the golf sports for the snowy places. Snow Golf is the conjugate of the night golf. It is the golf in the snowy winter season. In 1893, the father of snow golf, Rudyard Kipling, started to putt the golf ball into the tin can. In 19<sup>th</sup> century, the USGA (United States Golf Association) already set the game rule for the snow golf. However, the snow golf cannot keep the snowy golf course to operate in the winter. After 110 years, the snow golf still cannot play the highflying golf ball game. It is impossible to have the long drive of the golf ball in the snowy golf course. It is hard to find the golf ball in the white snow course. Therefore, the snow golf and night golf have the putting only.

Today the snow golf and the night golf already have the special rules and means. Both are the in-door golf activities to putting the golf ball to roll into the hole only. To have the long drive in night golf or snow golf, the LED and buzzer has to be installed on the golfball. However, as the golfball is hit with the impact of the golf club, the impact force will destroy the LED and buzzer. As the highflying golfball falls on the ground, the impact force will destroy the LED and buzzer installed in the golfball, too. Therefore, it is impossible to mount any signal indicator device on the golfball.

Why does the golf cost so much? The long drive of the golfball causes all the problems.

(i) The highflying golf ball is very dangerous that the golf cannot be played in the public park. It can only be played in the private golf course. Even in the private golf course, the highflying golf ball of the multiple groups of golfers will hit on each other and hurt each other. The golf cannot have multiple groups playing at the same time. For the safety reasons, golf has the 'tee-time' regulation. There is booking for the tee-time. At any time, only one group can play at one hole place of the golf course.

(ii) The long drive of golf cannot be played in the winter snow course. On the thick snow, there is no solid ground to place the tee. The golf ball has to be played on the snow directly. As the swiveling golf club hits the ball, the snow powders will sprays everywhere that you can not see where the golf ball flies. Even worse, as the highflying golf ball falls on the snow, the golf ball punches the snow pile and is buried in the snow. The golf ball disappears in the snow golf course. The golfer can never find the golf ball again until the snow melts in the next spring. So, there is no long drive in the snowy golf course. The golf course needs to shut down in the snowy winter season.

In 1893, the father of snow golf Rudyard Kipling introduced the snow golf which only had the putting golf ball to roll on the small area snow-clean ground activities. The snow golf does not have the long-range highflying golf ball activities. The snow golf is only in-house activities. It is no more the golf sport in the open field. The snow golf only has the putting activity. The snowy golf course still needs to shut down and lay off their employee. In the winter season, the snow golf only has the putting golf ball to roll into the hole activity. The golfer can putt in the house, not in the golf course. Today golf sport cannot play in the snowy golf course. In the winter season, the

golf course is filled with snow. The highflying golf ball falls on to the snow and buried under the snow. It is impossible to find the golf ball that the golf game cannot play in the snowy golf course in the winter season. The golf course has to be shut down in the winter. The employee is laid off for 3 months to half year. The golf courses lost a lot of money.

(iii) The golf ball is hit by the golf club seriously. As the high flying golf ball falling and hitting on the solid ground, the impact is seriously. Even LED embedded in the golf ball will be destroyed in the hitting and impact processes. So, there is no night golf.

Since the golh club launches the sky-ballet golfrisbee as the human hand throws the flying disk. The soft-landing is the essential characteristics of the flying disk. So, there is no impact force applying to the flying disk in both the launching and landing process. We may embed the LED light in the sky-ballet golfrisbee to have the Night Golh.

The long drive of the golf ball causes no night golf, no snow golf, no park golf and booking for tee-time. It causes the usage of the golf course to be low. In the park, the city government pays the “green fee.” In the private golf course, the golfers need to pay the green fee for the green grass. It causes the high operation cost of the golf course.

The Golh adopts the flying disk to solve the snow golf problem.

(1) For the long drive of golh, there is no hitting impact force during the launching golfrisbee process. As the golfrisbee falls on the ground, the golfrisbee has the soft-landing characteristics. The golfrisbee has the enough lift force to carry the miniature LED, buzzer and battery. So, the

LED and buzzer can be installed on the golfrisbee. The light and sound will lead the golher to locate and find the golfrisbee in the dark or in the snow very quickly.

(2) The sky-ballet golfrisbee is mounted on the golfrisbee club to launch to fly. The golfrisbee club does not contact with the snow powder at all. Therefore, the golher can see where the sky-ballet golfrisbee flies and lands.

(3) Due to the soft-landing of the sky-ballet golfrisbee, the sky-ballet golfrisbee will land on the top of the snow. The golher can identify the sky-ballet golfrisbee in the snow golf course easily.

(4) Due to safety of golfrisbee, the golf course can be as compact as a small park. The 18 holes paths can be folded as a net. The compact golf course can be located in the residential area, which is closed to the golfer customers. It is convenient and safe for the night golher.

Since the golfrisbee has the sound device and light device, the snow golh and night golh has the long Drive capability with golfrisbee. The golh can be played in the snowy golf course to be snow golh. The snow golf course just needs to blow the snow away from the putting hole area to clean out a small area for putting the golf ball. With the golh, the snowy golf course can continue operating in the winter season.

The golfrisbee can be played in the snowfield to be the ski golh. The ski golh is to play the golh with the cross-country-ski. The snow golh and ski golh are referred as white golh. With the golfrisbee, in the shiny sunshine, the golher can play the white golh. The white golh has the

different taste from the green golh. To play the white golh, we need to provide the auxiliary equipment. The complete system package includes the golh cart equipped with ski to play the ski golh.

Both snow golh and night golh have the high flying disk activity. Using the sky-ballet golfrisbee, the snow golh and the night golh have the complete golf course activity. The golh can boost up the golf course's income a lot. Definitely, the golf courses will welcome the golh for their own benefit of the golf course's income. Due to the night golh, the golf course can operate at night in the weekday or in the hot desert. With the night golh, the golf course can continue operating during the night. After the office hours, the businessperson can eat dinner in the restaurant of the golf course. Then go to play the night golh. Due to the snow golh, the golf course can operate in the snowy winter. With the golh, the golf course can increase the operation time and no shutdown in the snowy winter. The golh can boost up the income of the golf course. The golf courses definitely encourage the golfer to adopt the golh club to play golh after it becoming dark or snowy. This is the win-win solution for the golf course and the golhers. It reduces the golher's cost a lot, too. The member fee of the golf course will worth more. The golf course will sell the golh club and golfrisbee and encourage all the golfers to play golh in the night or in the snowy days. To encourage the golfer to play the golh, they will allow the golhers to share the same course and no tee-time!

However, the night golh and the snow golh have the tough times and tough places to play. Therefore, we make the innovation in the golh system pack to meet the challenges of all the tough environments. We make the innovation in golh system technologies based on our invention of golfrisbee. We integrate the technologies and make the innovation in system integration to meet

the technical challenges in park golh, night golh, ski golh and snow golh to promote the golh sports.

Eventually, as the golhers' population increases, the golh will be the dominant sport in the golf course. To play the golh in the golf course, the golh and golfrisbee technologies have to be compatible with the golf and ball technology. The swing of golh club is similar to the swing of golf club. The long-drive flying distance has to be compatible. As shown in the following table, the long drive flying capability of golfrisbee is about the same as flying golfball.

### **Technology Compatibility between Golfrisbee & Golfball**

	Golfball	PDGA Disc	Aerobee Disc
the long drive record	1200 ft.	712 ft.	1257 ft
average	900 ft.		

Now the flying disk technology is comparable with the golf technology. The long-drive champion record for the golf ball is about 1236 feet. The hand-throw Aerobee Ring has the flying range record to be 1257 feet. Therefore, the golfball and flying disk can be compatible to share the same golf course. Furthermore, we make the innovation for golfrisbee - the sky-ballet golfrisbee. The sky-ballet golfrisbee will make the flying disk flying higher and longer distance. With the sky-ballet golfrisbee, golh club and professional training with the golh swing trainer, almost all the people can launch the golfrisbee as well as and as far as the long drive of golf balls. From the following table of comparison, eventually the golh sport will be the dominant sport over the golf sport.

**Comparison Table for Golf & Golh**

Place/Time \ Sport		Golf	Golh/Golfrisbee
Golf Course	Tee-Time	Required	Not Required
	Cost	High	Low
City Park		Cannot Play	Can Play
Night		Only Putting	Long Drive & Putting
Weekday After Hours			
Desert		Cannot Play	Can Play
Snow Golf		Only Putting	Long Drive & Putting
Snow Golf Course			
Snow Field		Cannot Play	Can Play
Ski-Golf			
Disk Golf Course		Cannot Play	Can Play
Basedisk		Cannot Play	Can Play
Handisk, etc			

Furthermore, the way of golh swing is different from the way of golf swinging. There is the golh swing trainer to train the golfer to be the golher.

In golf, from long drive to putting, the golfer changes from wood club to steel club. The golfball does not change.

In golh, from long drive to putting, the golfer changes from golfrisbee to golf ball.



Golh is to introduce a complete system pack solution to the existing golf and flying disk problems. It offers the solution for the snow golf, night golf, park golf and disk golf. One unique golfrisbee disk will fulfill all the different tough requirements of the different golf sports. In addition, we need to provide the system pack solution.

The screw system of the golfrisbee cannot allow the dirt or sand to attach to it. We need to have the field cleaner to clean the sand and dirt away. Comparing with golf, the golh is a high-tech sport. To play good, you need to understand the mechanics, aerodynamics, etc. The most difficult problem is the initial static friction/stick force problem during the sky-ballet golfrisbee launching process. To swing consistently, each time the screw fit cap of the sky-ballet golfrisbee needs to be cleaned with blowing air and applied with lubricants of different viscosity. The static friction controller contains the compression air and lubricant.

The snow golf course and night golh courses are the tough play environment. We need special golh equipment for the snow golh and night golh. To play the snow golf in the snow golf course, there are other issues needed to be addressed. To play the snow golf in the field, it is impossible to drag the heavy golf bag to walk on the soft snow in the cold windy golf course. We need a specially designed golf cart to carry the bag and the golfer altogether.

To carry the heavy golf bag to walk on the soft snow is not an easy job. For the golf course in the desert of Las Vegas, the snake and animal will come out in the night. We need to minimize the hazards in the snow golh and night golh. The golh bag is integrated with the personal portable golh cart. The golher can ride on the personnel portable golh cart in the golf course to minimize the

hazards and speed up the play. As he arrives at the disk-landing place, he can step down the golh cart; pop the support stick to support the golh cart as the standing golf bag. The golh cart will serve as the standing bag as you play the golh. As the golher launches the sky-ballet golfrisbee disk, the golher can immediately step on the golh cart to run after the flying disk.

### **Background-Description of Prior Art**

Golf is the national sport of US. It is the representative sport of the capitalism. It is the rich people's sport. However, it becomes the critics and hatred target of the poor people in the world. Before, we do not care. After 911, we must consider that it is time for us to change the style of the golf sport. After 911, all the Americans are confused why the other worlds hate us so much? Golf sport is the representative for the hatred and is attacked by the outside western and well-developed countries. For the poor people, the golf is the rich people's sport. One-round of 18-hole play cost at least \$30.00, even more. It is the month living fees of the poor people. With the addition of the caddy's fee, the poor people cannot imagine to join the golf sport in all his life. No wonder the golf represents the wealthy people's sport to be the hatred for the poor people. Due to the hatred caused by envy, even the golf sport is so popular in US; however, the golf is still rejected to be the sport of the Olympic sport.

The snow golf is popular in the snowy place. The night golf is popular in the desert place. In the desert, it is very hot in the day. So, the night golf becomes popular. Both snow golf and night golf have golf limited to putting. There is no highflying golfball activity in the snow golf and night golf. The golfer cannot play the long drive in the nighttime or snowy field. As the golf club head hits on the golf ball, the LED, buzzer and battery embedded in the golf ball most likely will crack.

As the highflying golf ball hits on the solid ground, the LED, buzzer and battery most likely will crack, too.

Both basedisk and golh are the new sports based on the innovation of the golfrisbee. The basedisk is the golfrisbee adopting the baseball game rule. The golh is the hybrid sport constituted of the flying golfrisbee and golfball. The golh can play in the park to be the park golf. Golh is the park golf which is safe to play in the park. It is invented for the Olympic golf sport. You cannot play the golf in the park. However, you can fly disk in the park. The golh can be played in the park as the flying disk being played in the park. As the object flying in the sky, it is the flying disk. As the object rolling on the ground, it is the rolling ball. From long drive to putting, the golher changes the golfrisbee to be the golf ball. In golh, the golher does not change club. The same club can either launch the golfrisbee or putt the golfball. The LED and battery can be embedded in the flying disk. Because the golh club does not hit on the flying disk and the flying disk has the soft landing, the LED and battery will be left unharmed. You can play golh in the snow golf course. The flying disks will softly land on the top of the snow pile.

Furthermore, the golh can have the multiple groups to share the golf course at the same time. The multiple groups share the same tee-time. There is no need to reserve the tee-time anymore. Golh reduces the cost a lot for the member and increases the income of the golf course. It is the new golf standard which can play the golf in the snowy golf course. For the golh and basedisk sports, the golfrisbee completely changes the image about the golf with the flying disk technology. It will save the American from the hatred and attacks of the terrorism.

Golh will save the golf course in the winter season. The golf course can continue operating in the winter season. Accordingly, the innovations of golh and golfrisbee are not only in the golf technology and flying disk technology but also in the way of sporting system integration. Without the innovation of the sporting system integration, the golh sport will not be functional properly.

The golh is compatible to golf. The long drive of flying disk is compatible to the long drive of golf ball. The Guinness World Record set Aerobie Pro Ring (US patents 4,560,358 and 4,456,265) to be the world's farthestmost thrown object 1,257 feet. Actually, it is not the dome-shaped flying disk. It is a flat plate with ring shape. There are two reasons for the ring plate structure to be the farthestmost thrown object. The first is the thin profile of the ring plate; the second is the long-range stability. The thin profile has the low drag force. The long-range stability is due to the side stability of the spoiler rim to keep the straight flight. However, the side stability causes the Aerobie Ring not having the dogleg curving flying capability. The dogleg flying capability is emphasized in the disk golf course. Furthermore, the inclined edge of the spoiler rim induces the drag at the front and end edges that the throwing distance is reduced. The thin plate is without the proper protection. It easily hurts the other people. The flat plate ring is not safe to play in the park.

To make the flying disk to have the thin profile is not easy. The Aerobie Superdisc is the flying disk version of the Aerobie Pro Ring. However, Aerobie Superdisc no longer keeps the thin profile of the ring structure. The Aerobie Superdisc has the inclined curved edge with the dotted surface to increase the friction for handholding. At the edge, it has the spoiler rim for stable flight. The spoiler rim is more like the upright directional wing of the airplane or the damping board of the

boat. However, it induces many other drawbacks. At the leading edge, the spoiler rim will induce the separation of the boundary layer on the top of the flying disk. At the tailing edge, the spoiler rim will induce the separation of the flow from the soft cushion tail fin. Comparing to the Aerobie Pro Ring, the hand-thrown distance of Aerobie Superdisc is reduced a lot.

The US patent 4,568,297 of Innova disk has the flying range of 712 ft. It is a flying disk approved by the Professional Disc Golf Association (PDGA). The hand-thrown flying disk has the vertical sharp edge for handholding. The sharp vertical straight edge introduces a lot of drag. Outside the vertical sharp edge is the triangular design of the supersonic airfoil. However, the hand-thrown flying disk is always operating in the subsonic speed range. It is not a correct design for the front edge. The triangle is tilt upward. It is not correct design for the tail end, either. The speed of flying disk is much less than the sonic speed. For the subsonic airfoil design, it does not need the triangle. At the head side, the sharp edge does not have the supersonic effect. However, at the tail side, the vertical edge and the upward slope of the triangular design causes the separation of the airflow from the tail fin. It induces a lot of drag to the flying disk. Due to the vertical sharp edge, Innova Disk has to be thrown horizontally. Even worse, the sharp edge of triangular design causes the Innova disk to be unsafe for the park sport. Originally, the flying disk has the benefit to play in the park safely. However, the Innova disk destroyed the park sport benefit. The Innova disk is small and heavy with the sharp edge. The Innova disk is dangerous to the public that it cannot be played in the public park. Just like the golf ball is forbidden in the park, the disk golf is forbidden in the park, too. The disk golf is no more a “park sport.” Just like the golf, the disk golf needs to play in the “disk golf course.”

The drag force determines the flying distance. The wobbling phenomena and the abrupt shape are the most important two aerodynamic drag factors. To eliminate the wobbling, the structure of golfrisbee is symmetrical. To reduce the drag force, the golfrisbee shape is further smoothed. The essential difference between the sky-ballet golfrisbee and the conventional hand-thrown flying disk is that the sky-ballet golfrisbee gets rid of all the sharp edges. It has no edge at all. The sky-ballet golfrisbee has the dome shape smooth design in its middle portion. The sky-ballet golfrisbee with the skirt is safe to play in the park. It is the only flying disk having both the thin profile of the ring structure and the dome shape of the flying disk. The golfrisbee is launched with the golf club. The screw of golh club head is about half turn only. It makes the sky-ballet flying disk being able to have very thin profile. Since the sky-ballet golfrisbee is not thrown with hand, it has no edge designed for the hand holding and throwing. The sky-ballet golfrisbee is launched with the golh club; it does not need the hand holding vertical edge of flying disk. It has the smoothly curved design in the middle portion of the bottom of sky-ballet golfrisbee. The skirt introduces the side stability without the loss of the dog-leg fly capability. The skirt further has the bumper design to play safe in the park. Furthermore, the skirt serves as the bumper to protect the people from being hit. The skirt made of the foam material has the opening space between the golfrisbee main plane and the skirt. The skirt of the golfrisbee has the function of the long range stability of the spoiler rim; however, the skirt does not have the drag caused by the spoiler rim. Theoretically, the farthest distance comes from throwing angle at 45 degrees, not throwing level. The sky-ballet golfrisbee has no edge that it can launch at any angle. With the aerodynamic smooth airfoil design, thin ring structure and launching with the golh club, the sky-ballet golfrisbee will be the new Guinness World Record to set sky-ballet Golfrisbee to be the “Manpower throwing” World’s farthest thrown object.

The golh needs to play as the snow golh and the night golh. It is impossible for the golher to pull the golf trolley in the deep snow. It is extreme dangerous to walk in the dark field. The golh cannot use the existed golf facilities to play the snow golh or night golh. The golf never plays in the snow field or the dark field. The golf cart, golf trolley or golf bag is not designed for the snow golf or night golf. The golf cart is a four wheels electrical car. The golf trolley cannot carry golfer. The golf bag is too heavy to be used on the soft snow. Therefore, the golf cart or golf trolley is not capable to work in the snow field and the dark field. In the snow field and the dark field, the golh trolley has to be integrated with the golh cart and be able to carry the golher. The Dean L. Kamen et al's patents US5, 971,091 Transportation Vehicles and Methods and US6,302,230B1 Personal Mobility Vehicles and Methods do not have the trolley function of golh cart. Our new innovative golh cart is unique to have the multiple functions of the golh bag, golh trolley and golh cart. The golh cart is similar to the two-wheel golf trolley. However, the golher can ride on the golh cart.

The golf swing trainer provides guidance for the correct way of the swing of the golf club. Our golh swing trainer not only guides the swing path but also guides the swing speed and swing acceleration. The golher swing trainer integrates both the weight training and swing training in the same swing trainer.

### **Objects and Advantages**

The sports of golh, snow golh, ski golh, night golh, park golh, disk golh and basedisk are the golh sport family which is derived from our invention of the sky-ballet golfrisbee. We provide the

complete system packs solution for the golfrisbee sport family. The system pack includes the sky-ballet golfrisbee, golh club, portable hole base, static friction lubricant, swing trainer, self-lock golh bag, and golh cart. The cost of golh and basedisk are reduced with the integrated manufacturing process. It becomes the sport for the people. The golh, ski golh and basedisk, etc will be the first golf type sports to be the official Olympic Sports and Winter Olympic Sports.

## **Drawing Figures**

FIG. 1 is the golh sport being constituted of the golfrisbee and golfball. Swiveling the golh club, the golfrisbee is thrown into the golh basket and the golfball thrown to the hole; (B) the sport of basedisk is the golfrisbee being played as the baseball does; (C) is the golh sport being played as the shooting arrow does.

FIG.2 is elevation view of mounting the golfrisbee on the golh club; (A) the golfrisbee is engaged with the head of the golh club; (B) rotating the golfrisbee 180 degrees, the golfrisbee being locked and free dangling mounted on the head of golh club; (C) the golfball is engaged with the head of the golh club; (B) rotating the golfball 180 degrees, the golfrisbee being locked and free dangling mounted on the head of golh club.

FIG.3 is the top view of swiveling golh club to launch the golfrisbee and golfball; (A) after mounting the golfrisbee on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee; (B) swiveling forward to launch the golfrisbee; (C) the golfrisbee takes off and flies in the sky; (D) after mounting the golfball on the golh club, swiveling backward to the position to be ready to swivel forward to throw the golfball; (E) swiveling forward to throw the golfball; (F) the golfball is thrown in the sky.



FIG.4 The rotating mechanism of mounting and launching golfrisbee and golfball; (A) engaging the golfrisbee with the head of golh club; (B) rotating golfrisbee 180 degrees that the golfrisbee hangs and dangles on the head of the golh club; (C) swiveling the golh club, the golfrisbee rotates and launches from the head of golh club.

FIG.5 is the dynamics of the golfrisbee at the launching point.

FIG.6 The dynamic study of the launching angle of the golfrisbee; (A) the angle position that golfrisbee is too early to launch properly; (B) the optimum angle to launch the golfrisbee; (C) the angle position that golfrisbee is too late to launch properly.

FIG.7 Putting the golfrisbee and golf ball; (A) putting a golf ball into the portable hole; (B) putting the golfrisbee to roll into a cave.

FIG. 8 is the sky-ballet golfrisbee and golfball; (A) is the side view of the golfrisbee disk; (B) is the side view of the golfball; (C) is the right-hand golfrisbee club; (D) is the left-hand golfrisbee club.

FIG. 9 is the section view of the sky-ballet golfrisbee and golfball; (A) is the side section view of the golfrisbee disk; (B) is the side section view of the golfball; (C) is the section view of the right-hand golfrisbee club; (D) is the section view of the left-hand golfrisbee club.

FIG.10 The fundamental principles of the innovation of the universal directional flying wing of the golfrisbee; (A) is the conventional wing flying in the forward direction; (B) is the conventional wing flying in the backward direction; (C) is the overlap of the conventional wings flying in forward direction and the backward direction as shown in FIG.10A and FIG.10B; (D) is the bidirectional flying wing having the bidirectional flying capability which is the composition of the overlap of the uni-directional flying capability of the conventional wings; (E) is the conventional wing with the slat and flap flying in the forward direction; (F) is the conventional wing with the slat and flap flying in the backward direction; (G) is the overlap of the conventional wings with the slat and flap flying in forward direction and the backward direction as shown in FIG.10E and FIG.10F; (H) is the bidirectional flying wing with the slat and flap having the bidirectional flying capability which is the composition of the overlap of the uni-directional flying capability of the conventional wings.

FIG.11 The application of the bi-directional flying wing to the design of the golfrisbee disk having the disk shape with the universal directional flying capability; (A) is the sectional view of the golfrisbee having the sectional view of the bi-directional wing.; (B) is the isometric view of the golfrisbee disk; (C) is the aerodynamic analysis for the golfrisbee.

FIG.12 The application the bi-directional flying wing to the design of the golfrisbee ring having the ring shape with the universal directional flying capability; (A) is the sectional view of the golfrisbee ring having the sectional view of the bi-directional wing.; (B) is the isometric view of the golfrisbee ring.

FIG.13 The application the bi-directional flying wing to the design of the golfrisbee disk ring having the hybrid of disk and ring shape with the universal directional flying capability; (A) is the sectional view of the golfrisbee diskring having the sectional view of the bi-directional wing.; (B) is the isometric view of the golfrisbee disk ring.

FIG.14 The golh uses the golh club to throw the golfball; (A) is the golfball being thrown with the golh club as shown in FIG.14D; (B) is the section view of the golfball with the fast release latch; (C) is the golfball with the arrowhead; (D) is the golh club being swiveled to throw golfball and launch the golfrisbee to fly.

FIG.15 is the application of the golh club to throw the boomerang; (A) is the sectional view of the boomerang with the adaptor to be thrown with the golh club; (B) is the top view of the boomerang with the adaptor to be thrown with the golh club; (C) is the sectional view of the boomerang with the bi-directional wing segment to be thrown with the golh club; (D) is the top view of the boomerang with the bi-directional wing segment to be thrown with the golh club; (E) after mounting the golfrisbee on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of boomerang; (F) swiveling forward to launch the golfrisbee made of boomerang; (G) the golfrisbee made of boomerang takes off and flies in the sky.

FIG.16 is the application of the golh club to throw the odd-boomerang and even-boomerang; (A) is the sectional view of the multi-boomerang with the adaptor to be thrown with the golh club; (B) is the top view of the odd-boomerang with the adaptor to be thrown with the golh club; (C) is

the top view of the even-boomerang with the adaptor to be thrown with the golh club; (D) is the sectional view of the odd-boomerang with the bi-directional wing segment to be thrown with the golh club; (E) is the top view of the odd-boomerang with the bi-directional wing segment to be thrown with the golh club; (F) is the top view of the even-boomerang with the bi-directional wing segment to be thrown with the golh club; (G) after mounting the golfrisbee made of tri-boomerang on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of tri-boomerang; (H) swiveling forward to launch the golfrisbee made of tri-boomerang; (I) the golfrisbee made of tri-boomerang takes off and flies in the sky.

FIG.17 is the application of the golh club to throw the polygon-boomerang; (A) is the sectional view of the polygon-boomerang with the adaptor to be thrown with the golh club; (B) is the top view of the polygon-boomerang with the adaptor to be thrown with the golh club; (C) is the sectional view of the polygon-boomerang with the bi-directional wing segment to be thrown with the golh club; (D) is the top view of the polygon-boomerang with the bi-directional wing segment to be thrown with the golh club; (E) after mounting the golfrisbee made of triangle-boomerang on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of triangle-boomerang; (F) swiveling forward to launch the golfrisbee made of triangle-boomerang; (G) the golfrisbee made of tri-boomerang takes off and flies in the sky.

FIG.18 is the application of the golh club to throw the universal directional flying wing golfrisbee disk; (A) is the sectional view of the universal directional flying wing golfrisbee disk with the screw adaptor to be thrown with the golh club; (B) is the top view of the universal directional flying wing golfrisbee disk with the adaptor to be thrown with the golh club; (C) is the

sectional view of the universal directional flying wing golfrisbee disk with the universal directional wing segment to be thrown with the golh club; (D) is the top view of the universal directional flying wing golfrisbee disk with the universal directional wing segment to be thrown with the golh club; (E) after mounting the golfrisbee made of disk on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of disk; (F) swiveling forward to launch the golfrisbee made of disk; (G) the golfrisbee made of disk takes off and flies in the sky.

FIG.19 is the application of the golh club to throw the universal directional wing golfrisbee ringdisk; (A) is the sectional view of the golfrisbee ring with the screw adaptor to be thrown with the golh club; (B) is the top view of the golfrisbee ring with the screw adaptor to be thrown with the golh club; (C) is the sectional view of the golfrisbee ringdisk with the universal directional wing segment to be thrown with the golh club; (D) is the top view of the golfrisbee ringdisk with the universal directional wing segment to be thrown with the golh club; (E) after mounting the golfrisbee ringdisk on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee ringdisk; (F) swiveling forward to launch the golfrisbee ringdisk; (G) the golfrisbee ringdisk takes off and flies in the sky.

FIG.20 is the application of the golh club to throw the golfrisbee diskring; (A) is the sectional view of the golfrisbee diskring with the screw adaptor to be thrown with the golh club; (B) is the top view of the golfrisbee diskring with the screw adaptor to be thrown with the golh club; (C) is the sectional view of the golfrisbee diskring with the universal directional wing segment to be thrown with the golh club; (D) is the top view of the golfrisbee diskring with the universal directional wing segment to be thrown with the golh club; (E) after mounting the

golfrisbee diskring on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee diskring; (F) swiveling forward to launch the golfrisbee diskring; (G) the golfrisbee diskring takes off and flies in the sky.

FIG.21 is the application of the golh club to throw the golfrisbee multi-boomerang ringdisk and diskring; (A) is the partial exposed elevation view of the golfrisbee multi-boomerang ringdisk and diskring with the screw adaptor to be thrown with the golh club; (B) is the top view of the golfrisbee odd-boomerang ringdisk and diskring with the screw adaptor to be thrown with the golh club; (C) is the top view of the golfrisbee even-boomerang ringdisk and diskring with the screw adaptor to be thrown with the golh club; (D) is the partial exposed elevation view of the golfrisbee multi-boomerang ringdisk and diskring with the universal directional wing segment to be thrown with the golh club; (E) is the top view of the golfrisbee odd-boomerang ringdisk and diskring with the universal directional wing segment to be thrown with the golh club; (F) is the top view of the golfrisbee even-boomerang ringdisk and diskring with the universal directional wing segment to be thrown with the golh club; (G) is the top view of the golfrisbee with the arrowhead; (H) after mounting the golfrisbee made of multi-boomerang ringdisk and diskring on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee tri-boomerang ringdisk and diskring; (I) swiveling forward to launch the golfrisbee made of multi-boomerang ringdisk and diskring; (J) the golfrisbee made of multi-boomerang ringdisk or diskring takes off and flies in the sky.

FIG.22 is the implementations of the golfrisbee boomerang ringdisk and diskring; (A) is the partial exposed elevation view of the golfrisbee boomerang ringdisk or diskring with the screw

adaptor to be thrown with the golh club; (B) is the sectional view of the golfrisbee boomerang disk with the universal directional wing of disk type; (D) is the golfrisbee boomerang ring disk with the universal directional wing.

FIG.23 is the section view of the sky-ballet golfrisbee which is the boomerang disk as shown in FIG.8A; (A) is the bottom view of the sky-ballet golfrisbee taken at the horizontal line X-X in FIG.23B; (B) is the horizontal section view of the sky-ballet golfrisbee taken at the horizontal center line in FIG.23A; (C) is the vertical section view of the sky-ballet golfrisbee taken at the vertical center line Y-Y in FIG.23A; (D) the boomerang polygon derived from the combination boomerangs of FIG.16 and FIG.17 is similar to the boomerang disk ring; (E) the boomerang polygon golfrisbee has the same structure as FIG.23A; the sky-ballet golfrisbee is the edge numbers of polygon to be infinite.

FIG.24 is the section view of the sky-ballet golfrisbee having the punched through fitting screw cap and the boomerang wing segment with the adjustable angle of attack ; (A) is the bottom view of the sky-ballet golfrisbee taken at the horizontal line W-W in FIG.24B; (B) is the horizontal section view of the sky-ballet golfrisbee taken at the horizontal center line in FIG.24A; (C) is the vertical section view of the sky-ballet golfrisbee taken at the vertical center line Z-Z in FIG.24A.

FIG.25 is the section view of the sky-ballet having the ring shape; (A) is the bottom view of the sky-ballet golfrisbee; (B) is the horizontal section view; (C) is the vertical section view.

FIG.26 is the section view of the sky-ballet golfrisbee with the exchangeable screw cap and weight-balanced design; (A) is the bottom view of the sky-ballet golfrisbee; (B) is the horizontal section view; (C) is the vertical section view.

FIG.27 is the golfrisbee static friction controller which has the functions of air compressor, air cleaner and lubricant; (A) is the golfrisbee static friction controller at the idle position; (B) is the golfrisbee static friction controller in the air compression mode; (C) is the golfrisbee static friction controller at the air cleaning mode; (D) is the golfrisbee static friction controller in the lubrication mode.

FIG.28 is the airfoil shape of the golfrisbee boomerang wings; (A) is the section view of an airfoil for the lift-upward motion with right hand rotation; (B) is the section view of an airfoil for the lift-up motion with left hand; (C)) is the section view of an airfoil as shown in FIG.10D for the lift-upward motion; (D) is the section view of an airfoil for the diving-downward motion with right hand rotation; (E) is the section view of an airfoil for the diving-downward motion with left hand rotation; (F) is the section view of an airfoil for the diving-downward motion;

FIG.29 is the two-wheel golh trolley; (A) is the two-wheel golh-pulling trolley; (B) is the integrated two-wheel golh trolley with the golh bag; (C) is the ski type golh trolley; (D) is the belt type golh trolley.

FIG.30 is three-wheel type foldable and portable personal golh cart; (A) is the side view of the personal golh cart; (B) the personal golh cart stands as standing bag; (C) is the back view of the personal golh cart; (D) is the side view of the personal golh cart having the snow ski; (E) is the personal golh cart having the snow ski stands as stand-up bag; (F) is the back view of the personal golh cart having the snow ski.

FIG.31 is two-wheel type foldable and portable personal golh cart; (A) is the side view of the personal golh cart; (B) is the personal golh cart stands as standing bag; (C) is the back view of the personal golh cart; (D) is the side view of the personal golh cart having the automatic ski



capability; (E) is the personal golh cart having the automatic ski capability and also serving as standing bag; (F) is the back view of the personal golh cart having the automatic ski capability.

FIG. 32 shows the operation of the automatic ski system; (A) is on the hard ground, the ski is not engaged with the ground; (B) is the detailed mechanism of the automatic ski not engaged with the ground as shown in FIG.31A; (C) is on the soft ground, the ski is engaged with the ground; (D) is the detailed mechanism of the automatic ski engaged with the ground as shown in FIG.31C.

FIG. 33 shows the operation of the fast installment of the ski shoes of the golh cart; (A) is the shaft of wheel fed into the notch on the ski frame; (B) is the shaft of wheel fed into the guided slot of ski shoe; (C) the lock plate is closed to have the shaft of wheel sealed in the slot; (D) the hook of the spring is mounted on the shaft to have the automatic bias of the automatic operation of the snow ski.

FIG. 34 is the snow ski having the elongated guiding slot to have snow ski to be packed.

FIG.35 is the snow wheel; (A) is the snow wheel rolling on the solid ground; (B) is the snow wheel rolling on the snow.

FIG. 36 (A) is the section view of the integrated waterproof LED light for sky-ballet golfrisbee; (B) is the top view of the integrated waterproof LED light for sky-ballet golfrisbee.

FIG. 37 (A) is the section view of the integrated waterproof sound generator for sky-ballet golfrisbee; (B) is the top view of the integrated waterproof sound generator for sky-ballet golfrisbee.

FIG. 38 is the partial section view of the self-locked golh bag; (A) the cap of the self-locked golh bag is in the locked position; (B) the cap of the self-locked golh bag is uncapped and is self-locked at the bottom of the bag.

FIG.39 is the portable base for the golh putting and basedisc.

FIG.40 is golh super swing trainer; (A) is the isometric view of the golh super swing trainer; (B) is the side view of the golh super swing trainer; (C) is the guide implemented with the gear for the golfrisbee club; (D) is the guide implemented with the steel rope for the golfrisbee club.

FIG.41 is the golh simulator.

FIG.42 is the working flow of the golfrisbee disk and golfrisbee hut; (A) the module process for golh club and golfrisbee; (B) the assembly flow for the golh club and golfrisbee.

FIG.43 The plastic injection module for the golfrisbee with double injection; (A) the plastic injection of the elastic material for the main plane which include the screw adaptor; (B) the retrieve and rotation of the screw module; (C) the open of the injection modules, the golfrisbee without distortion is formed.

FIG.44 The golfrisbee design for the plastic injection module for triple injection; (A) is the top view of the golfrisbee disk; (B) is the top view of the golfrisbee diskring made of three different plastic material; (C) is the sectional view of the golfrisbee diskring made of three different plastic material.

FIG.45 The plastic injection module for the golfrisbee with triple injection; (A) the plastic injection of the elastic plastic material for the main plane; (B) as the modules open, the pore for the screw is formed; (C) the plastic injection of the hard plastic for the screw; (D) as the modules open, the screw is formed.

FIG.46 The plastic injection for the skirt which can be integrated with the double injection or triple injection; (A) the plastic injection of the soft skirt plastic material; (B) the modules open and the completed golfrisbee is formed.

FIG.47 The golfrisbee design for the plastic injection module for triple injection of golfrisbee with backbone plate; (A) is the top view of the golfrisbee disk with backbone plate; (B) is the top view of the golfrisbee disk with backbone plate made of three different plastic material; (C) is the sectional view of the golfrisbee disk with backbone plate made of three different plastic material.

FIG.48 The plastic injection for the backbone plate which can be integrated with the double injection or triple injection; (A) the plastic injection of the hard backbone plastic material; (B) the plastic injection for the main body of golfrisbee with the backbone plate being embedded.

## **Description and Operation**

As shown in FIG.1A, the golh is the hybrid golf sport constituted of golfrisbee 1 and golfball 15. The golh sport is to swivel the golh club 2 to launch the golfrisbee 1 to fly and throw the golfball 15. The golfrisbee 1 is to be thrown into the golfrisbee basket 18 with the golh club 2. The flag 18f is mounted at the top of the golfrisbee basket 18. The flag is not only to mark the destination and basket/hole number but also the indication of the wind direction and wind speed. The golh player needs to adjust the way to throw the golfrisbee to compensate the influence of the wind direction and wind speed. The golfball 15 is to be thrown to the hole then put the ball 151 to roll into the hole or portable hole 6 with the golh club. The golh is the long drive of golf playing with the golfrisbee disk 1 and golfball 15. The flying distance of the golfrisbee 1 is compatible with the

golfball 15. For the conventional flying disk, the flying distance is much less than the golfball 15 and the conventional golf ball. Therefore, the golfrisbee 1 has the special design to have the long range flying capability. All the shape of the sky-ballet golfrisbee 1 has the streamline design for integrity. There is no abrupt line segment or sections as most of the flying disk and ring do. With the golh club 2, it will be the human power farthest throw in the world to be the new Guinness world record 1257 feet. Furthermore, the golfrisbee 1 is designed to be safe to play as the conventional flying disk does.

As shown in FIG.1B, the golfrisbee can play as the baseball does and it referred to be the basedisk. The attacker 111 swivels the golh club 2att to launch the golfrisbee 1att and runs. The defender catches the golfrisbee 1att then swivels the golh club 2def to launch the golfrisbee 2def to block the attacker 111. For the basedisk, the baseball is replaced with the golfrisbee disk. The sporting rules of basedisk are similar to the sporting rule of baseball. FIG.1C shows the golh sport can play as the arrow shooting gain. Swiveling the golh club, the golfball type arrow 15a or the golfrisbee type arrow 1a is shot at the target 18a.

FIG.2 is an elevation view of the mounting operations of the golfrisbee 1 and golfball 15. As shown in FIG.2A, the golfrisbee 1 is mounted on the head 11 of golh club 2. Then the golfrisbee 1 is rotated 180 degrees to dangle on the head 3 of golh club 2 as shown in FIG.2B. As shown in FIG.2C, the golfrisbee 1 is mounted on the head 3 of golh club 2. Then the golfrisbee 1 is rotated 180 degrees to dangle on the head 3 of golh club 2 as shown in FIG.2D.

FIG.3 is the top view of the swiveling operations of the golfrisbee 1 and the golfball 15. As shown in FIG.3A, the golh club 2 is swiveled back to be ready to throw the golfrisbee 1. As shown

in FIG.3B, due to the eccentric force, the golfrisbee 1 rotates. As shown in FIG.3C, the golfrisbee 1 takes off and flies in the sky. As shown in FIG.3D, the golh club 2 is swiveled back to be ready to throw the golfball 15. As shown in FIG.3E, due to the eccentric force, the golfball 15 rotates. As shown in FIG.3F, the golfball is thrown in the sky.

From FIG.4 to FIG.6, the mechanics of the golh club operations are analyzed in details. FIG.5 is to illustrate the most important principle of the golh sport – the mounting golfrisbee position is the same as the launching golfrisbee position at the vertical straight extension line of the golh club. FIG.4A shows the golfrisbee 1 is mounted on the head of the golh club 2 at the extension of the vertical straight line of the golh club 2. FIG.4B shows the golfrisbee 2 rotates 180 degrees and dangles on the head of golh club 2. FIG.4C shows the golfrisbee rotates 180 degrees due to the eccentric force of the swiveling circle of golh club 2 and launches to fly at the same position of the mounting golfrisbee 1.

The golfrisbee 1 is one kind of the flying object only. The golh club can be used to throw many different flying objects such as disk, ring, boomerang, etc. The fitting screw for flying object is pivotally mounting on the club head of golh club 2. The pivotal mount is eccentric to the flying object. The flying object pivotally rotates due to the eccentric force induced by the swivel of club 2. As shown in FIG.3, the rotation of flying object is in parallel to a plane of the swivel of the golh club. The fitting screw 13 is pivotally rotating on the club head 34 as the golh club 2 is swiveled with hands. The flying object with the fitting screw 13 is pivotally mounted on the club head 34. The fitting screw 13 has frictionless lock and release with club head 34. The flying object is launched to fly with club head 34 based on the directional relation between the club head 34 and fitting screw 13. The club head 34 is located at an end portion of the pole that flying object is mounted at an end of the club 2. The flying object rotates due to the eccentric force of the swivel

of club 2 that the fitting screw 13 pivotally rotates to an position to unlock the frictionless lock with the golh club head 34. The flying object is released and launched to fly at the release position.

The fitting screw 13 and club head 34 not only serves as a pivotally rotation but also serves as a directional lock and release. With the directional lock and release mechanism being embedded between the club head 34 and the fitting screw 13, swiveling the pole of golh club 2, said flying object automatically rotating toward outside of the swiveling circle due to the eccentric force. The automatically rotating of the flying object changing directional relation with the club head 34 from the lock to release of the directional lock and release mechanism. The head 34 releases the fitting screw 13 to launch the flying object to fly,

FIG.5 shows the dynamics of the swiveling golh club 2 at the launching point. At the launching position, the golfrisbee 1 has the tangential velocity  $V$  and the angular momentum  $M$ . As shown in FIG.3, swiveling the golh club 2 in a circle with hand, the golh club 2 transfers momentum and eccentric force to the flying object to rotate the flying object to a new direction to release the lock. With the momentum transfer, the eccentric force causes the pivotal rotation and generates gyroscopic force to stabilize flying object flying. The pivotal rotation of the flying object causes the directional lock and release mechanism of fitting screw 13 and club head 34 from lock to release. The flying object is driven to fly in a long distance with a swivel of the golh club 2.

FIG.6 illustrates the selection of the optimum launching point. As shown in FIG.6A, if the golfrisbee 1 launches before it arrives the vertical straight more than 5 degrees, it is too early to launch the golfrisbee 1. As shown in FIG.6B, if the golfrisbee launches at 5 degrees before it

arrives the extension line of the golh club 2, it is the optimum point to launch the golfrisbee 1. As shown in FIG.6C, if the golfrisbee launches after it arrives the vertical straight line, it is too late to launch the golfrisbee 1.

FIG.7 shows the swiveling golh club 1 to put the ball and golfrisbee to roll. The head golh club 2 is in the shape of the head of golf club. A side of the golh club head is to launch the flying objects to fly and the other side is to put the ball 151 as conventional golf club does. FIG.7A shows the ball being put with club 2 to roll into a universal portable hole 6. FIG.7B shows the golfrisbee 1 seats on the universal portable hole and is put with golh club 2 to roll into a portable hole 6.

FIG.8 and FIG.9 show the basic golh set which includes the golfrisbee 1, golfball 15 and golh club 2. As shown in FIG.8, it shows the set of the sky-ballet golfrisbee. The golfrisbee has two kinds of design. As shown in the FIG.23, it shows the helicopter type boomerang wing segment 17. As shown in FIG.25, it shows the UFO disk type design. The sky-ballet golfrisbee 1 has a skirt 16. The skirt 16 has several functions.

- (1) It serves as the bumper to protect both human and the golfrisbee itself. The skirt is made of the soft material such as foam rubber. The skirt 16 has the skirt hanger 161 extended into the sky-ballet golfrisbee body.
- (2) The skirt 16 serves as the stabilizer at the side of the golfrisbee for the long range flight as the empennage does. At the front of the golfrisbee, the skirt 16 serves as the guiding slot to guide the air flowing above the golfrisbee as the slot slat does. It reduces the drag force at the front end. This design is the subsonic airfoil design. It is completely different from the Innova Disk.

The Innova Disk has the triangle front end being the supersonic airfoil design. However, for the supersonic wing operates at the subsonic speed, it induces a lot of drag force.

(3) At the tail of the golfrisbee, the skirt 16 guides the airflow to wash downward to increase the lift and drifting distance as the slot flap does.

On the contrary, in the Innova patent, the design of triangle rim will cause the air flowing upward, instead downward. It reduces the airlift force of the flying disk.

FIG.8B shows golfball 15 which uses the same launching mechanism as golfrisbee 1 does.

The flying object is a golfball 15. The golfball 15 comprises a ball 151 and a stick 152.

The fitting screw 13 is mounted on an end of said stick 152. The other end of said stick 152 is inserted in the ball 151. FIG.8C is the right-hand golh club 2R; FIG.8D is the left-hand golh club 2L. The weight 23 is to train the golher to develop the golh muscle. The slot 231 is to have the weight 23 to be mounted on the golh club. The fixed handle is located at the end of the golh club. The sliding handle 21 is to have the natural slow-to-fast swing movement. The slot 211 is to have the sliding handle to be mounted on the golh club.

FIG.9 is the section view of the sky-ballet golfrisbee and the golh club. The sky-ballet golfrisbee is in the UFO shape with right-handed screw cap 13R and left-handed screw cap 13L. This is the basic model of the sky-ballet golfrisbee 1. Due to the co-existence of the screw caps 13R and 13L, the weight of sky-ballet golfrisbee 1 is well balanced. Due to the weight balance, it does not have the wobbling phenomena that the sky-ballet flying distance is much longer than the unbalanced flying disk. Furthermore, the screw caps 13R and 13L are embedded in the sky-ballet body itself. Since the screw cap 13R and 13L are located at the rim. To embed the screw cap 13R and 13L in



the body of the sky-ballet golfrisbee, the rim of the sky-ballet golfrisbee has the ring band 1rb structure as shown in FIG.10H. It reduces the aerodynamic drag force that the sky-ballet golfrisbee can fly longer and further. The left-hand screw 34L is fit in the left-hand cap 13L; the right-hand-screw 34R is fit in the right-hand cap 13R. Except the left-hand screw 34L, the structure and operation of the left-hand golh club 2L are the same as the right-hand golh club 2R.

The right-handed screw 3R has the right-handed screw 34R notched on its top end. The bottom of the right-handed screw stub 3R is pivotally mounted in the club head 36. The screw 3R is locked with the locking screw 35. For one fixed cap 13R, the rotation of screw 3R determines the launching position on the swiveling circle of the swiveling golh club 2R as shown in FIG.6. To launch the golfrisbee with golh club properly, the allowance of angle of the screw 3R rotation is only 5 degrees.

FIG.9B is the exposed cross-section of the golfball. The golfball 15 has one handle 152 with the screw 1520 to screw in the ball 151. The ball 151 is similar to the conventional golf ball. A light means and/or sound means 12 being installed in the middle of said female screw 13R, and said male screw 3R being empty in the middle portion to adapt the light means and/or sound means 12.

The extension club locker 22 is optional. To adjust the length of golh club, the golh club has two segments. Releasing the extension club locker 22, the lower segment 2B is slidable in the upper segment 2U. Locking the extension club locker 22, the lower segment 2B is locked in the upper segment 2U. The length of golh club is adjusted to be the ideal club length of the golher.

The rotational motor 70 is optional. In the most popular used basic golh club 2, the rotational motor 70 doesn't need at all. The operation of the basic golh club completely relies on the swivel of club with hands. As use the rotational motor, the locking screw 35 is released to allow the screw 34R to have the free rotation. The rotation motor index 71 is the stopping position of the rotational motor 70. The battery 5 embedded in the handle is to supply the power to the rotation motor 70. The switch 51 is to turn on and turn off the rotation of the rotation motor 70. There is turn-on process and turn-off process. For the turn-on process, the battery power is first on, and then the rotation motor 7 starts to rotate. For the turn-off process, the motor rotator first stops the screw 34R at the position prescribed by the index 71. Then the battery power is shut down.

Swiveling the golh club 2 to launch the golfrisbee, the golfrisbee 1 rotates on the golh club 2 with the golh club head 34 being the pivotal center. It builds up the angular momentum. The rotational radius is large. As the golfrisbee takes off, the center of rotation is at the center of the golfrisbee. The rotational radius becomes small. According to the conservation of angular momentum, the rotation speed of the golfrisbee will become faster. The effect is similar to the ballet dancer shrinking her hands in front of her chest to speed up the spin speed. Therefore, the golfrisbee is referred to be the sky-ballet golfrisbee. To increase the sky-ballet effect, the ring band mass is reduced and the center mass is increased with the addition of weight 12 as shown in FIG.9.

The golh sport is constituted of two core technologies - the universal wing and the swiveling club technologies. As shown in FIG.8A, the golfrisbee 1 is the merge of the technologies of disk, ring and boomerang. Since the golh is a brand new sport, so we introduce the innovation of golh

product step and step as shown from FIG.10 to FIG.26. It is noted that FIG.9A is the view of the golfrisbee as shown in FIG.11B; FIG.8A is the view of the golfrisbee as shown in FIG.12B.

The design of the ultra long flying disk is much different from the conventional flying disk and frisbee. To keep the golfrisbee 1 horizontal statue to fly for the ultra long distance, the golfrisbee rotates and uses the gyroscopic force to stabilize the horizontal flight statue. Furthermore, for the ultra long distance flying disk of golfrisbee 1, the low drag force airfoil of the wing and the side stability are the most important issues. Without the side stability, the golfrisbee 1 will roll in the side direction then lose the lift force and falls to ground.

So far, there is no flying disk use the aerodynamic airfoil as shown in FIG.10A to design the flying disk. The golfrisbee is the first to apply the wing theory of the aerodynamics to design. As shown in FIG.10A, being relative to the wind direction  $1w$ , as the conventional uni-directional flying wing with airfoil 1mf flies in the wind with the tip forward, the wing with airfoil 1mf is flying in the forward direction. As shown in FIG.10b, being relative to the wind direction  $1w$ , the conventional wing with airfoil 1mb can not fly in the backward direction. However, the golfrisbee is rotational during the flight to maintain its horizontal flying status. The golfrisbee must fly in both forward direction and backward direction. Actually, for the rotational golfrisbee, we need the universal directional flying capability. However, for simplicity, we use bi-directional flying wing to make the analysis and design for the universal flying

To fly in both forward direction and backward direction, as shown in FIG.10C, the forward flying wing with airfoil 1mf and the backward flying wing with airfoil 1mb are overlapped. The

forward wing 1mf and the backward wing 1mb are adjusted to have the maximum overlap of the upper curvatures. Then the transition smooth curvatures are connected between the forward wing 1mf and the backward wing 1mb. The lobe 1rb is formed. As shown in FIG.11, for the golf frisbee disk, the lobe 1rb becomes the ring band. The envelop of the overlapped wing, as shown in FIG.10D, is the airfoil with main plane 1m of the bi-direction flying wing of the golf frisbee.

To increase the performance of the wing, the wing is further has additional wing segments. As shown in FIG.10E, the wing with airfoil 1f is constituted of main plane 1mf, slat 1f1, slat slot 1f2, flap 1f3, and flap slot 1f4. Slat 1f1 is auxiliary airfoil fitted to the leading edge of the wing. At high angles of attack, the angle of attack of the slat 1f1 being less than that of the main plane 1mf, there is a smooth air flowing over the slat 1f1 which tends to smooth out the eddies forming over the wing 1f. Slat 1f1 is fitted to the leading edge near the wing tip to improve lateral control. Slot 1f2 is the passageway built into the wing 1f a short distance from the leading edge in such a way that, at high angles of attack, the air flows through the slat slot 1f2 and over the wing 1f, tending to smooth out the turbulence due to eddies.

As shown in FIG.11 and FIG12, the slat 1f1 also serves as the wing fence at the position 16fn. In the conventional unidirectional flying wing, the wing fences is fin-like vertical surfaces attached to the upper surface of the wing, that are used to control the airflow. On swept wing airplane, the wing fence prevents the drifting of air toward the tip of the wing at high angles of attack. On straight wing airplane, the wing fence controls the airflow in the flap area. In both cases, the wing fence gives better slow speed handling and stall characteristics.

As shown in FIG.10E, the flap 1f3 is a high lift device which increases the camber of the wing 1f and also increases the effective wing area. The use of flap 1f3 gives better take-off performance and permits steeper approach angles and lower approach and landing speeds. Flap slot 1f3 makes the flap 1f3 to be slotted flap 1f3. The Slotted flaps 1f4 produce lift in excess of drag.

Since the golfrisbee is a rotating during flight, as the wing 1f rotates 180 degrees, the wing tail become wing tip as shown in FIG.10F. To make the golfrisbee to fly with wing tail as the wing tip does, we need to make the innovation of the wing. As shown in FIG.10G, the forward wing 1f and backward wing 1b are overlapped together. The cross section of the universal directional flying golfrisbee wing 1 as shown in FIG.10H is the envelope of the forward wing 1f and backward wing 1b as shown in FIG.10G. The skirt 16 is serves as both slat 1f1 and flap 1f3 as the conventional wing slat and flap do.

This bi-directional wing can be generated to be plural directional wing. A plural directional wing has a plural directional flying capability. As shown in FIG.10 is the bi-directional wing. The bi-direction wing can be extended to plural direction wing to have flying capability in a plural direction. For the rotational flying disk, we need to have the universal direction ring. As shown in FIG.11, it shows the golfrisbee disk having the universal directional flying capability to have the rotational flying capability. For each flying direction, the plural directional wing has a cross section to be the envelop of a forward direction of a uni-directional wing cross section 1f or 1mf and a backward direction of a uni-directional wing cross section 1b or 1mb as shown in FIG.10C and FIG.10G. There are transitional smooth curves between the forward

direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section. For each flying direction of the plural direction wing has the cross section as shown in FIG.10D and FIG.10H.

For the rotationally flying disk, the disk needs to have the universal direction flying capability. The universal direction flying wing is in a disk shape. The disk shape wing has any section view crossing a center of said disk to be a cross section to be the envelop of a forward direction of a uni-directional wing cross section 1f and a backward direction of a uni-directional wing cross section 1b, There are transitional smooth curves between the forward direction of a uni-directional wing cross section 1f and the backward direction of a uni-directional wing cross section 1b. For the high performance uni-direction wing further comprises a slot slat 1f1 and a slot flap 1f3.

The envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section forming a disk 1m made of the main planes and the slot skirts made of s slot slat 1f1 and slot flap 1f3. As shown in FIG.11B and FIG.12B, being relative to the wind direction 1w, at the position 16st, the skirt serves at the slotted slat 1f1; at the position of 16fps the skirt serves as the slotted flap 1f3.

Furthermore, the skirt 16 serves as the empennage of tail assembly of the conventional airplane does. The empennage gives stability to the aircraft. The skirt serves as the horizontal stabilizer and the vertical stabilizer or fin. As shown in FIG.11B and FIG.12B, at the position 16em, the skirt 16 serves as the vertical stabilizer. At the position 16fps, the skirt 16 serves as both flap 1f3 and the horizontal stabilizer. As the skirt 16 serves as the horizontal stabilizer, the skirt 16 is used to prevent the golfrisbee from pitching up or down. As the skirt 16 serves as the vertical stabilizer, the skirt 16 is used to prevent the golfrisbee from yawing in side direction. It serves to

offset the tendency of the golfrisbee to roll in the side direction. As shown in FIG.11C, the principle behind the skirt operation is the compensation of the difference of lift force with the difference of the downwash air flow. As the wind  $1w$  blows on the golfrisbee 1, due to the rotation of the golfrisbee 1, one side flow  $1rl$  has the higher relative wind speed than the other side  $1rr$ . According to the Bernoulli Law, the difference of relative wind speed over the main plane  $1m$  generates the different air pressures that the lift forces  $1pl$  and  $1pr$  on two sides are different. Due to the viscosity of boundary flow over the main plane  $1m$ , the absolute air flow speeds  $16al$  and  $16ar$  on two sides are different. The air flows hit on the skirt  $16$  and flow downward with different speeds. The different speeds air flow generates the different forces  $16sl$  and  $16sr$ . The momentum caused by the difference of the lift forces  $1pl$  and  $1pr$  will be compensated with the momentum caused by the difference of the forces  $16sl$  and  $16sr$ . So the golfrisbee 1 can be kept to fly horizontal position for the ultra long distance fly.

As shown in FIG.12, the wing is in a ring shape wing. The ring shape wing has the section view crossing the center of the ring to be the envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section. There are transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section.

As shown in FIG.12, the universal direction wing developed from the disk in FIG.10H can be applied to the wing of the flying ring. The cross section of the golfrisbee ring is in the shape of the golfrisbee disk as shown in FIG.10H and FIG.11A. FIG.12B is the isometric view of the FIG.8A. As shown in FIG.12B, for the front portion  $16st$  of the ring, the outer skirt serves as the slat; the

inner skirt 16fps serves as flat. For the rear portion of the ring, the inner skirt serves as the slat 16st; the outer skirt serves as the flat 16fps. At the right side and left side, both the outer skirt and inner skirt serve as the empennage 16em.

FIG.13 shows the combination or hybrid of the golfrisbee disk and golfrisbee ring structure. The golfrisbee disk 1h has a central hole. The skirt 16 is also installed along the rim of the central hole. It is wrong idea to differentiate the flying disk from flying ring. Actually, there is no distinguishing between the golfrisbee disk and the golfrisbee ring. To keep the flying stability of the flying disk, there is one golden rule: the radius of the disk cannot be more than 20 times of the skirt height. If the radius of the flying disk is larger than 20 times of the vertical height of the skirt, then the hole must be introduced to the center of the flying disk to keep the ratio of the span of the main plane to the skirt height being less than 20. If there is a hole in the disk, then it referred to be ring. However, the flying structure of ring is still the same as the disk.

The second core technology of the golfrisbee is the swiveling club throwing technology. The swiveling club throwing technology not only throws the golfrisbee 1 but also throws the golfball 15, boomerang, etc. FIG.14 shows the golh set made of the golfball 15 and golh club 2. The fit mechanism between the flying object and the head of golh club is screw. To reduce the air drag force, the fit screw of the flying object is female screw 13 and the head of golh club 2 is male screw 3. The light and sound generator 12 is embedded in the female screw 13. There is one pore 34p in the screw head 3 to adapt the light and sound generator 12 as the golfball 15 is mounted on the screw head 3. The golfball 15 is thrown with the golh club 2 as shown in FIG.1A. The fast release latch 1521 is biased by a spring hidden in the bar 152. The fast latch 1521 fits in the notch



1511 in the ball 151 to lock the bar 152 with the ball 151. Twist the bar 152, the fast release latch 1511 will be suppressed and the bar 152 can be pulled out of the ball 151. Then the ball 151 can be put to roll into the hole 6 as shown in FIG.7A. As shown in FIG.14C, there is one arrowhead 151a attached to the golfball 15. The fin 153 is to control the throwing direction of the golfball 15. As shown in FIG.1C, the golfball 15 is thrown to fly and shoot at the target board 18a.

FIG.15 shows the swiveling golh club and the universal direction wing technology applying to boomerang 171. The flying object is a boomerang 171. The boomerang 171 comprises two branches jointing together at a central joint. The fitting screw 13 is mounted at the central joint. Fig.15A and FIG.15C is the application of the swiveling golh club technologies to the boomerangs 171m and 171. As shown in FIG.15A, the boomerang 171m is made of two branches and each branch has the cross section as shown in FIG.10D. As shown in FIG.15C, the boomerang 171 is made of two branches and each branch has the cross section as shown in FIG.10H. As shown in FIG.15E, the golh club 2 is swiveled backward to be ready to throw the golfrisbee boomerang 171. As shown in FIG.15F, due to the eccentric force, the golfrisbee boomerang 171 rotates. As shown in FIG.15G, the golfrisbee boomerang 171 takes off and flies in the sky.

FIG.16 shows the swiveling golh club and the universal direction wing technology applying to multi-boomerang 172. The flying object is a multi-branches boomerang 172, the boomerang 172 comprises multiple branches jointing together at a central joint. For the odd number of branches, the boomerang will turn and fly back. For the even number of branches, the boomerang will not turn. Adjusting the number of the branches, we can control the curvature of fly path. To have the eccentric force, the fitting screw 13 is mounted at ends of branches. Fig.16A and FIG.16C

is the application of the swiveling golh club technologies to the tri-boomerang 172m and 172. As shown in FIG.16A, the tri-boomerang 172m is made of three branches and each branch has the cross section as shown in FIG.10D. As shown in FIG.16C, the tri-boomerang 172 is made of three branches and each branch has the cross section as shown in FIG.10H. As shown in FIG.16E, the golh club 2 is swiveled back to be ready to throw the golfrisbee tri-boomerang 172. As shown in FIG.16F, due to the eccentric force, the golfrisbee tri-boomerang 172 rotates. As shown in FIG.15G, the golfrisbee tri-boomerang 172 takes off and flies in the sky.

FIG.17 shows the swiveling golh club and the universal direction wing technology applying to polygon boomerang 173. The flying object is a polygon boomerang 173, The polygon boomerang 173 comprises branches jointing together to form a polygon. The fitting screw 13 is mounted at joints of the branches. For the odd number of edges, the polygon boomerang will turn and fly back. For the even number of edges, the polygon boomerang will not turn. Adjusting the number of the edges, we can control the curvature of fly path. Fig.17A and FIG.17C is the application of the swiveling golh club technologies to the triangle boomerang 173m and 173. As shown in FIG.17A, the boomerang 173m is made of three edges and each edge has the cross section as shown in FIG.10D. As shown in FIG.17C, the triangle boomerang 173 is made of three edges and each edge has the cross section as shown in FIG.10H. As shown in FIG.17E, the golh club 2 is swiveled back to be ready to throw the golfrisbee triangle boomerang 173. As shown in FIG.17F, due to the eccentric force, the golfrisbee triangle boomerang 173 rotates. As shown in FIG.17G, the golfrisbee triangle boomerang 173 takes off and flies in the sky.

FIG.18 shows the swiveling golh club and the universal direction wing technology applying to golfrisbee disk 1d. The flying object is a disk 1d. Fig.18A and FIG.18C is the application of the swiveling golh club technologies to the golfrisbees 1dm and 1d made of flying disk. As shown in FIG.18A, the golfrisbee 1dm has the cross section as shown in FIG.10D. As shown in FIG.18C, the golfrisbee 1d has the cross section as shown in FIG.10H. A light and sound generator 12 is installed in the middle of female screw 13. The male'screw 34 of club head is empty in the middle portion. The light and sound generator 12 is embedded in the cavity of female screw 13 not only to reduce air drag to increase throwing distance of flying disk but also having weight balance for the flying disk. As shown in FIG.18E, the golh club 2 is swiveled backward to be ready to throw the golfrisbee disk 1d. As shown in FIG.18F, due to the eccentric force, the golfrisbee disk 1d rotates. As shown in FIG.18G, the golfrisbee disk 1d takes off and flies in the sky.

FIG.19 shows the swiveling golh club and the universal direction wing technology applying to the golfrisbee ringdisk 1r. The flying object is a ringdisk 1r. Fig.19A and FIG.19C is the application of the swiveling golh club technologies to the golfrisbee ringdisks 1rm and 1r. As shown in FIG.19A, the golfrisbee ringdisk 1rm has the cross section as shown in FIG.10D. As shown in FIG.19C, the golfrisbee 1r made of the ring has the cross section as shown in FIG.10H. As shown in FIG.19E, the golh club 2 is swiveled backward to be ready to throw the golfrisbee ring 1r. As shown in FIG.19F, due to the eccentric force, the golfrisbee ringdisk 1r rotates. As shown in FIG.19G, the golfrisbee ringdisk 1r takes off and flies in the sky.

FIG.20 shows the swiveling golh club and the universal direction wing technology applying to golfrisbee 1h made of the hybrid of the disk and ring. The flying object is a

diskring 1h. Fig.20A and FIG.20C is the application of the swiveling golh club technologies to the golfrisbee diskings 1hm and 1h. As shown in FIG.20A, the golfrisbee diskring 1hm has the cross section as shown in FIG.10D. As shown in FIG.20C, the golfrisbee diskring 1hm has the cross section as shown in FIG.10H. As shown in FIG.20E, the golh club 2 is swiveled back to be ready to throw the golfrisbee diskring 1h. As shown in FIG.20F, due to the eccentric force, the golfrisbee diskring 1h rotates. As shown in FIG.20G, the golfrisbee diskring 1h takes off and flies in the sky.

FIG.21 shows the swiveling golh club and the universal direction wing technology applying to boomerang diskring or boomerang ringdisk. As shown in FIG.22, the same golfrisbee 1 has the structure to be diskring 1dr as shown in FIG.22B or the structure to be ringdisk 1rd as shown in FIG.22C. Both of them are referred to be the sky ballet golfrisbee 1. The skyballet golfrisbee has the hybrid structure of the disk, ring and boomerang. Fig.21A and FIG.21D are the application of the swiveling golh club technologies to the sky ballet golfrisbee 1 made of the boomerang diskring 1dr or boomerang ringdisk 1rd. As shown in FIG.21A, the golfrisbee 1m is the main plane of the structure either to be the main plane of diskring 1dr as shown in FIG.22B or the structure of main plane to be the main plane of ringdisk 1rd as shown in FIG.22C.

As shown in FIG.22B, the flying object is a boomerang type diskring 1dr. The boomerang 17 is at the center portion of the diskring 1dr. The boomerang 17 is constituted of a plural of branches. As shown in FIG.22C, the flying object is a boomerang ringdisk 1rd and

the boomerang is at the center portion of said diskring 1dr. The boomerang 17 is constituted of a plural of branches. As shown in FIG.21C, the golfrisbee 1 has the cross section is either to be diskring 1dr as shown in FIG.22B or the cross section of ringdisk 1rd as shown in FIG.22C. As shown in FIG.22G, the golh club 2 is swiveled backward to be ready to throw the sky ballet golfrisbee 1. As shown in FIG.21H, due to the eccentric force, the sky ballet golfrisbee 1 rotates. As shown in FIG.21J, the sky ballet golfrisbee 1 takes off and flies in the sky. As shown in FIG.21G, there are arrowheads 1a around the peripheral of the golfrisbee 1m. As shown in FIG.1C, swiveling the golh club, the golfrisbee with arrowhead hits and attached on the target board 18a.

FIG.23 shows the alternative design of the sky-ballet golfrisbee 1 made of the boomerang diskring. As shown in FIG.23D, the boomerang polygon is the combination of two different boomerang 172m and 173m as shown in FIG.16 and FIG.17. Comparing with the boomerang polygon as shown in FIG.23E with the boomerang diskring as shown in FIG.23A, the boomerang ring disk is the boomerang polygon with the number of edges to be infinite. The sky-ballet golfrisbee 1 is also considered to be the combination of the boomerang 172m as shown in FIG16 and the diskring 1h as shown in FIG.20. As shown in FIG.23, the hole 42 in the ring band is to reduce the weight. The center weight 12 is added to the center of the sky-ballet golfrisbee to increase the sky-ballet effect. The center weight 12 is constituted of the weights 120, 124 the screw 122 and the nut 123. For the night golf and/or snow golf, the weight 120 and/or 124 can be either the light source and/or the sound source. For the ultra long distance, the addition of the weight is not easy. If the weight is larger than the aerodynamic lift force, the flying disk will dive downward and the flying distance is decreased instead of increase. So the light or sound needs to

design very compact to reduce the weight and size. As shown in FIG.36, the weight 120 is the light source for the night golf. The screw 122 passes the hole 1203 to hold the light 120 to the sky-ballet golfrisbee 1. The light source 1200 emits the light in the night golh to guide the golher to locate the sky-ballet golfrisbee. To save the power, the light sources are LED. The LEDs have different colors. As the golfrisbee rotates in the night, it has the rainbow in the dark sky. The switching button 1201 can be pushed to shut the battery power. The switching button can be capacitor type that the seal of 1201 can be solid. The battery and the switching circuit 1202 are to supply the power and light control to the light source 1200.

As shown in FIG.37, it shows the sound source 124 is to add the weight at the center of the sky-ballet golfrisbee. The screw 122 passes the hole 1243 to hold the sound source 124 to the sky-ballet golfrisbee 1. The speaker 1240 generates the sound to guide the golher to locate the sky-ballet golfrisbee. The switching button 1241 can be pushed to shut the battery power. The switching button can be capacitor type that the seal of 1241 can be solid. The battery and the switching circuit 1242 are to supply the power and light control to the light source 1240.

As shown in FIG.28, to have the video, audio effect, enhanced sky-ballet effect and the curved flying capability, the sky-ballet golfrisbee is modified to be the helicopter type sky-ballet golfrisbee. The wing 17 has many different wing segments to modify the curved flying path of the sky-ballet golfrisbee. As shown in FIG.28A, the wing 17 having the segment 17a is for the right-hand golh club to have the curved up flying path. As shown in FIG.28B, the wing 17 having the segment 17b is for the left-hand golh club to have the curved up flying path. As shown in FIG.28C, the wing 17 having the segment 17c is for the left-hand golh club or right-hand club to

have the curved up flying path. The segment 17c is derived from the bidirectional wing segment 1m as shown in FIG.10D. As shown in FIG.28D, the wing 17 having the segment 17d is for the right-hand golh club to have the curved down flying path. As shown in FIG.28E, the wing 17 having the segment 17e is for the left-hand golh club to have the curved down flying path. As shown in FIG.28F, the wing 17 having the segment 17f is for the left-hand golh club or right-hand club to have the curved down flying path.

As shown in FIG.24, the golfrisbee has the universal wing 17a. The wing segment 17a can adjust the angle of attack to change the flying path of the golfrisbee. The wing segment 17a has the short stub 17b pivotally fit in the golfrisbee body. Changing the angle of the attack of the wing segment 17a, the lift force of the golfrisbee will change. The flying path of the golfrisbee will change accordingly.

There are many different versions of the sky-ballet golfrisbee. As shown in FIG.24, the cap 131L is the punched through cap. For the punched through type cap, the launching angle can be increased a lot. Furthermore, the sky-ballet golfrisbee 1 can be made much thinner. It can reduce the drag force. The flying distance can be much farther. As shown in FIG.25 the wing segment 17 is optional to be removed to be a sky-ballet golfring. As shown in FIG.26, the sky-ballet golfrisbee has only one right hand cap to minimize the air drag. To have the weight balance, the air bubble 13b is embedded in the golfrisbee body on the opposite site of the cap. The volume of the air bubble is the same as the volume of the cap.

The screw needs the lubricant to reduce the static friction. The initial static friction causes the uncertainty during the golh club swiveling process. To have the consistent swiveling process and expected result, the lubrication is needed to eliminate the stick force of the initial static friction. Furthermore, as the golfrisbee falls on the ground, the dirt sticks to the screw of the cap. It will cause the inconsistent swiveling result. So, the cap 13 of the sky-ballet golfrisbee is needed to be checked and cleaned quite often.

As shown in FIG.27, in the field operation, we use the static friction controller 7. It has the three processes to be integrated in one device: the air compression, the air clean and the lubricant application. The static friction controller is constituted of the compressing cylinder 70, the switching block 71, the spraying nozzle 72 and the container 74. The lubricant 75 is stored in container 74. The cap 742 is to seal the lubricant 741 entrances. The spraying nozzle 72 is mounted on the top of the sliding cylinder 70. The sliding tube 70 can be fit in the hole 722. The cavity 723 guides the fluid into the nozzle 720. The hole 721 is to fit for the spraying tube. As the finger presses on the spraying nozzle 72, the sliding cylinder 70 slides downward as shown in the FIG.27B. The one-way compression piston 7021 moves upward to seal the conduit. The one-way compression valves 714 moves downward to allow the air to be sucked into the conduit 713. The air inside the switching block compartment 716 is forced to flow out into the container 74. As the finger is released, the sliding cylinder 70 moves upward under the air pressure in the compartment 716. The air inside the conduit 713 is compressed and the one-way valve 714 is closed. As the air pressure inside the conduit 713 is larger than the air pressure in the compartment 716, the one-way valve 7021 moves downward and the compressed air flows into the compartment. Repeating the



process as shown in FIG.27A and FIG.27B reciprocally, the air pressure inside the container 74 is built up.

To use the compressed air to clean the cap of the golfrisbee or the screw of the golh head, as shown in FIG.27C, the finger holds the sliding tube at the position to have the conduit 701 to align with the hole 711 on the wall of the switching block 71. The compressed air flows through the hole 711, the conduit 701, the cavity 723, and the nozzle 720. The compressed air blows on the cap or screw to blow away the dirt. As the dirt is cleaned, the golher can apply the lubricant 75 to the cap or screw. As shown in FIG.27D, the finger holds the sliding tube 70 at the position to have the conduit 701 to align with the hole 712 on the wall of the switching block 71. The lubricant 75 flows throw the hole 712, the conduit 701, and the cavity 723 and the nozzle 720. The lubricant 75 sprays on the cap and screw to lubricate the cap and screw.

Depending on the distance between the threads of the screw, there are many different golh club heads. Therefore, the golher may carry several golh clubs. However, to carry the golh bag walking on the snow is not so easy. So, the trolley is needed. As shown in FIG.29A, the golh trolley 5 is mounted on the axle 500 of wheels 50. The foldable handle 51 pulls the frame 52 to drag the golh trolley 5 forward. The supporter 55 is hinged to the ear 520 on the frame 52 with the pivotal axle 550. The golh bag 4 is leaned against the frame 52. FIG.29B shows the golh bag being integrated with the portable trolley 5a. To ski on the snow, as shown in FIG.29C, the trolley 5 is mounted on the snow ski 901. To ski on the snow and run on the road, as shown in FIG.29D, the trolley is mounted on the belt wheel 501. The belt wheel is composed of two wheels 5011 and 5012, belt

5013 and triangle structure 5014. The trolley 5 is pivotally mounted on the top node of the structure 5014.

To play the night golh in the desert or the snow golh in the heavy snow northern place, the golher has to ride on the cart. In the desert, during the day, the temperature is too high to play golh. The only time to play golh is in the night. However, in the night, the snakes come out, too. The golher has to ride on the golh cart. In the heavy snow place, the snow depth can be very deep. It is impossible for the golher to ski to drag the golf trolley. The golher has to ride on the golh cart, too.

There are two kinds of cart. One is three-wheel golh cart 8 as shown in FIG.30. The golher can stand on the golh cart 8 to drive the golh cart. The golh cart is a foldable and portable golh cart. Releasing the extension lock 821, the length of pole 82 can be adjusted. The pole 82 is foldable with the pivotal joint 830. The technique for the golh cart adopts our former patent US5, 474,144 Twin-Wheel Motor Car with Differential Height and Speed Mechanism. It needs only one motor to drive the twin- wheels 80. Since it is the three wheels, it does not need the complicate self-balance circuits and control. It does not have the speed limit as the two wheel golh cart does. So, the cost becomes much cheaper and the speed is much faster. As shown in FIG.30C, the front wheel 86 is mounted on the support frame 82 with the axle 860. Rotating the handle 81, the frame 82 rotates which also causes the front wheel 86 to rotate to change direction. The twin-wheels have the differential mechanism to drive the wheels 86 to have the different speed during the turning direction. In FIG.30B, the support 85 pivotally rotates on the axle 850 to support the ear 820. The support 85 supports the frame 82. The golf cart is served as the standing bag and golh trolley.

To run on the deep snow in the golf course, the wheel can change to be the snow wheel 80s as shown in FIG.35. The wheel paddle 801 is at the end of the cylinder 802. The cylinder 802 is under the bias of the spring 803. As shown in FIG.35A, the snow wheel 80s rolls on the solid ground. The wheel paddle 801 is compressed to be the same circle as the wheel 80s. As shown in FIG.35A, the snow wheel 80s rolls on the snow. The wheel paddle 801 is expanded into the snow to serve as the paddle. The wheel paddle 801 expels the snow to drive the golh cart 8 forward or backward.

As shown in FIG.30D to FIG.30F, the golh cart 9 is further equipped with the automatic golh snow ski 9. As shown in FIG.32A and FIG.32B, the automatic golh snow ski 9 is raised up to run on the solid ground. As shown in FIG.32C and FIG.32D, the automatic golh ski 9 is lowered to support the weight of golh cart 9 to drive on the soft snow. The wheel can be changed to be the snow wheel 80s.

As shown in FIG.32B, there is a Z-shape guiding slot 910 notched on the guiding plate 91. The wheel axle 600 passes through the Z-shape guiding slot 910. The spring 92 connects between the axle 600 and the ski 9 to pull the ski forward to raise the ski 9. The spring 92 is constituted of two segments 923 and 924. The segment 924 has the hooked end 921 to hook the axle 600. The segment 924 has the hooked end 920 to hook the ear 923 of the guiding board 91. Under the compression force of the spring 92, the guiding plate 91 is pulled forward to raise the ski 9 up.

As shown in FIG.32C, the wheel rolls on the soft snow 95 and traps in the snow 95. The snow 95 contacts with the ski 9. As the wheel 60 rotates to drive the golh cart to move forward,

due to friction, the ski 9 is left behind. The wheel axle 600 climbs up the slope of the Z-shape guiding slot 910 forces the ski 9 downward to engage with snow 95 to support the weight of golh carts.

FIG.33 shows the installation of the snow ski without removing the wheel. As shown in FIG.33A, the wheel axle 600 passes the slot and presses the locking plate 912 downward. The locking plate 912 is pivotally mounted on the guiding plate 91 with the pin 9120. FIG.33B shows the axle 600 is mounted in the guiding slot 910. FIG.33C shows the locking a plate is closed with the biasing spring. FIG.33D shows the hook 921 is attached to the axle 600 and the installation is finished. FIG.34 shows the lower slot of Z-shape guiding slot can make the extension to be the guiding slot 910e. The snow ski 9 can be folded to integrate with the golh cart or golh trolley.

FIG.31 shows the two-wheel golh cart. The golh cart is foldable and portable. Releasing the extension lock 621, the length of pole 62 can be adjusted. The pole 62 is foldable with the pivotal joint 630. The golh cart can be further innovated from the Segway of Dean L. Kamen et al's patents US5, 971,091 Transportation Vehicles and Methods and US6,302,230B1 Personal Mobility Vehicles and Methods. The supporting stick 65 is pivotally mounted on the frame 62 with the pivotal axle 650 passing the ear 620 of the frame 62. The two-wheel golher cart 6 is served as the standing bag as shown in FIG.31B. The snow ski 9 can be mounted as shown in FIG.32D, FIG.32E and FIG.32F. The wheel can be changed to be the snow wheel 8s, too.

FIG.38 shows the self-locked portable golh bag for traveling golher. As shown in FIG.38A, the golf bag has the self-lock cap 43 being self locked with the golf bag 42. The handle 41 is to carry the golh bag 42 or to hang the golh bag 42 on the golh cart as shown in FIG.30. Under the biasing spring 431, the pressing plate 432 presses against the top rim of the golh bag 42. Under this pressure, the protrude 430 is locked in the notch 4210. To open the golh bag, press cap 43 downward, the protrude 430 moves downward to slide in the slot 421. Rotating the cap 43, the protrude 430 slides to the end of the horizontal segment of the slot 421. Lifting up the cap 43, the golh bag 42 is opened. As shown FIG.38B, the cap 43 can be held at the bottom of golh bag 42 to facilitate the carry of the golh bag 42. Sliding the protrude 430 into the vertical segment of the slot 422 and press the cap 43 upward. As the protrude hits the end of the vertical segment, rotating the cap 43 horizontally to the end. Releasing the pressure on the cap 43, under the biasing force of the spring 431, the pressing plate biases against the bottom plate of the golh bag 42. Under the biasing force, the protrude 430 is fit in the notch 422. The self-locked cap 43 is self-locked to the bottom of the golh bag 42.

To play the basedisc, we need the portable base. To play the golh in the park, we need the portable-putting hole. As shown in the FIG.39, it shows the universal portable hole base. It can be used as either the base in the basedisc or the putting hole in the park golh. The rolling golfball can roll upward on the inclined plane 452 and the plateau 451 into the hole 450. The flag 46 has the flag 461 to mark the number of the hole. The flag is inserted in the hole 450 of the base 45 with the stub 460 fitting inside the hole 450.

The swing of golh is different from the swing of golf. To launch the golfrisbee with the golh club, the swing speed and the swing pattern is very important. To train the golher to be familiar with the swing way of golh, as shown in FIG.40, the golh swing trainer 10 is important for the golh instructor. The golher stands inside the golher trainer and has the golher club 2 fit inside the swing glider 23s as the same position as the payload 23 shown in FIG.8. The handle 21s is fit at the position 21 shown in FIG.8. The Computer aided golh instructor 101 drives the solenoid tube 1022 located inside the tube 102 to rotate to drive the gliding stub 1021 and the swing glider 23s to slide. The swing glider 23s is to guide the correct swing speed of the golh club. In FIG.40D, it shows the alternative design of the guide. As the pulley 101p pulls the rope 1025, the guide 23s slides to move to guide the correct swing speed.

The golh simulator is the miniature of the portable wheel balance machine. Instead of balancing the wheel, we apply the same principle and mechanism to measure the rotation of the golfrisbee 1. The golher can easily check the simulating results of flying distance, launching angle, launching speed, and flying direction on the LCD screen. Furthermore, the golher can adjust the parameter of the viscosity of the lubricant, the starting angle, the launching angle of the screw, etc to find the optimum swing pattern for himself. With the golher simulator, the golher does not need to go through the tedious “launching and walking, trial and error” process and improve his techniques systematically.

FIG.41 is the golh simulator 11. The golfrisbee 1 is mounted on the rubber wheel head 111. The rubber 1111 envelops around the steel drum 1110 to be the rubber head. Any golfrisbee cap 3 can easily fit on the rubber wheel head 111. As the golher swings the golher club, the sensors 113

and microprocessor 114 of balance mechanism record and analyze the dynamical behaviors of the golfrisbee. The dynamics results are shown on the LCD display. The LCD display 112 is mounted on pole of the golf club.

The golfrisbee is made of the composite material to be one single piece. Furthermore, the golfrisbee has the screw. Therefore, the mass production manufacture process is very important to the golh industry. As shown in FIG.42A, the manufacture of making golh club and golfrisbee module is highly complicated four step process. In the first step, the golh club head locking screw 35, launching stubs 34 R and 34L are cast with model. As shown in step 2, the locking screw 35 is put in the club head module to cast the golh head with the locking screw 35. As shown in step 3, the launching stubs 34 R and 34L are put in the golfrisbee module to cast the golfrisbee with the launching screws. As shown in step 4, the golfrisbee is put in the skirt module to have the skirt 16 cast to be one unit with the golfrisbee 1.

FIG.42B shows the assembly process of the golh club and golfrisbee. In Step 5, the handle, golf club head, golf club pole and golf launching stub are assembled to be the golh club. In Step 6, the payload 124, screw 123 and golfrisbee body are assembled to be golfrisbee 1. In step 7, the golfrisbee 1 is mounted on the launching screw stub and is ready for launching test. The detailed production process and flow are discussed in details as follows.

As shown in FIG.9, the golfrisbee is made of two materials. The skirt 16 material is made of the soft material 16s as shown in FIG46. The main plane 1m material is made of the elastic material 1me as shown in FIG.43. It adopted the double injection plastic modules as shown in

FIG.43 and FIG.46. As shown in FIG.44, the golfrisbee is made of three materials. It adopted the triple injection plastic modules as shown in FIG.43 and FIG.46. To minimize the air drag, as shown in FIG.43, the callouts show the details of the curvatures for the stubs which support the skirt 16.

During the plastic module injection, to generate the screw 13 of the golfrisbee, it must rotate to retrieve the screwed module head 13s. The rotation of the screwed module head 13s will cause the distortion of the main plane 1m of the golfrisbee 1. To get rid of the distortion due to the rotation of the screwed module head 13s, there is the need for the special module injection process. A plastic injection module for the flying object comprises a screw module 13s and a main plane cavity module 190, said screw module 13s rotates to retrieve from said main plane cavity module 190 before said plastic injection modules 190 and 191 are open. As shown in FIG.43A, as the modules 190 and 191 close, the elastic plastics 1me is injected into the cavity of the main plane 1m. After the plastic injection, the screwed module head 13s rotates and retrieves from the cavity as shown in FIG.43B. The modules 190 and 191 still close and press on the injected plastic main plain 1m to release the stress on the main plane 1m with the residue heat of the plastic injection and keep the main plane 1m in the original shape. After the main plane 1m is harden, then the module 191 opens as shown by the arrow 191t.

To increase the life of the golfrisbee 1, as shown in FIG.44, the screw bore 13 is made of the hard plastic material. The screw 134 is in the shape of dual half ring. The golfrisbee is constituted of three kinds of material: the soft skirt 16, the elastic main plane 1m and the hard screw 13. The composite golfrisbee 1 adopts the triple plastic injection process. To reduce the air drag, as shown in FIG.44C, the skirt support 161 envelops the edge of the main plane 1m. There are smooth



transition curves between the skirt 16 and the main plane 1m. As shown in FIG.45A, the pore 13p reserves a hole 1mp as the elastic material 1me is injected for the main plane 1m. As shown in FIG.45B, the modules are separated and the hole 1mp is formed in the main plane 1m. Then the hard plastic 1mh is injected and the screwed module head 13s is inserted in the reserved pore as shown in FIG.45C. As shown in FIG.45D, the screw module head rotates and retrieves then the modules 190 and 191 open, the hard female screw 13 is formed.

As shown in FIG.46A, the soft plastic 16s is injected for the skirt 16. As the module 190 and 191 open, the complete golfrisbee 1 is done. It notes that the soft plastic 16s injection can be integrated with either FIG.43 or FIG.44 to have the double injection or triple injection to minimize the production cost.

As the golfrisbee is large and flat for the long throwing distance, the distortion of plastic injection becomes problem. To overcome the shrinkage distortion in plastic injection, as shown in FIG.47, the backbone plate 1mk is embedded in the golfrisbee disk or golfrisbee ring. The screw 13 is integrated with the backbone plate 1mk. As shown in FIG.48, the backbone plate 1mk and screw 13 are injected with the hard plastic material 1mh. Then the backbone plate 1mk with the screw 13 is put in the cavity to be injected and enwrapped with the elastic plastic material injection 1me. The high technology and high performance golfrisbee is made of the composite material with the complex manufacturing process.

While the invention has been particularly shown and described with reference to the preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

We claim:

21. A plural directional wing means having a plural directional flying capability,

in each direction of said plural directional, there being bi-directional airfoil means having bi-directional flying capability,

said bi-directional airfoil means has a cross section being an envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section, there being transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section;

said uni-directional wing cross section being an airfoil of conventional airplane having a blunt tip portion and a narrow tail portion;

said bi-directional airfoil means having a maximum curvature fitting for an upper curve of said forward direction of a uni-directional wing cross section and an upper curve of said backward direction of a uni-directional wing cross section;

said bi-directional airfoil means having lobe means caused by said blunt tip portion of said uni-directional wing cross section;

said bi-directional airfoil means having an transitional curve from said lobe means of one uni-directional wing to a tail of another uni-directional wing and view versa;

said lobe means forming a ring band of plural directional wing means;

with said plural directional wing means, a flying object being able to fly in plural directions.

22. A plural directional wing means according to claim 21 of which said uni-direction wing further comprising a slot slat and a slot flap,

Said slot slat of a forward direction of said uni-directional wing overlapping with said slot flap of said backward direction of said uni-directional wing to form a skirt;

Said slot slat of a backward direction of said uni-directional wing overlapping with said slot flap of said forward direction of said uni-directional wing to form another skirt;

said an envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section forming a main body being made of main planes and slot skirts being made of said slot slats and slot flaps to be said bi-directional airfoil;

said main plane of said bi-direction airfoil form a polygon main plane of said plural directional wing means; said slot skirt forming a polygon skirt ring around said polygon main plane of said plural directional wing means;

Said slot skirt being at ends of said main plane, said slot skirts serving both slot slat, slot flap, fence and empennage; said skirt serving as a slot slat in the upward wind direction, said skirt serving as a slot flap in the downward wind direction, said skirt serving as a fence in the inclined direction of said wind and said skirt serving as a empennage at side direction being relative to said wind direction.

23. A plural directional wing means according to claim 21, said plural directional wing being in a circular disk shape wing, said circular disk shape wing having any section view crossing a center of said disk to be a cross section being an envelop of a forward direction of a uni-

directional wing cross section and a backward direction of a uni-directional wing cross section, there being transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section;

a ring band being made of said lobe being at bottom of said disk to generate aerodynamic lift for said disk.

24. A plural directional wing means according to claim 21, said wing being in a ring shape wing, said ring shape wing having section view crossing a center of said ring to be a cross section being an envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section, there being transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section;

two ring band being made of said lobe being at bottom of said disk to generate aerodynamic lift for said ring.

25. A plural directional wing means according to claim 23, of which said disk means being a boomerang disk means,

said disk means having a central hole in said disk means;

a boomerang being at a center portion in said hole of said disk means, said boomerang being constituted of a plural of branches.

Said branch having one end joining at center of said disk means and another end being attaching to said disk along edge of said hole.

26. A plural directional wing means according to claim 24, of which said disk means being a boomerang ringdisk means,

a boomerang being at a center portion of said ring means, said boomerang being constituted of a plural of branches.

Said branch having one end joining at center of said ring means and another end being attaching to said disk along an interior edge of said ring means.

27. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means by hands and said club means for being swiveled with hands to rotate said flying means and throwing said flying means to fly,

said club means being constituted of a pole means for being swiveled with hands in a circle to throw said flying means to fly and a head means for said flying means being pivotally mounted and said flying means being thrown out to rotate to fly in sky,

said flying means rotating and being thrown to fly in sky and a fitting means for said flying means being pivotally mounting on said head means of club means, said pivotally mounting being eccentric to said flying means that said flying means pivotally rotating due to an eccentric force of said swivel of pole means that said rotation of flying means being in parallel to a plane of said swivel of said club means, said fitting means being pivotally rotating on said head means and changing directional relation with said head means as said pole means being swiveled with hands; said flying means with said fitting means being pivotally mounted on said head means and having frictionless lock and release with said head means and being launched to fly with said head means based on said directional relation between said head means and fitting means;

said head means being located at an end portion of said pole means that said disk means being mounted at an end portion of said club means;

said flying means rotating due to said eccentric force of said swivel of club means that said fitting means pivotally rotating to an position to unlock said frictionless lock with said head means that said disk means being released and being launched to fly at said position;

said fitting means and head means not only serving as a pivotally rotation but also serving a directional lock and release; with a directional lock and release mechanism being embedded between said head means and fitting means, swiveling said pole means of said club means, said flying means automatically rotating toward outside of said circle due to said eccentric force, said automatically rotating of said flying means changing directional relation with said head means from said lock to release of said directional lock and release mechanism that said head means releasing said fitting means to launch said flying means to fly,

swiveling said club means in a circle with hand, said club means transferring momentum and an eccentric force to said flying means to rotate said flying means to a new direction to release said lock; with said momentum transfer, said eccentric force causing pivotal rotation and generating gyroscopic force to stabilize said flying means flying and said pivotal rotation of said flying means causing said directional lock and release mechanism of said fitting means and head means from lock to release, said flying means being driven to fly in a long distance with a swivel of said club means.

28. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27 of which said head being in the shape of the golf head, a side of said

head to launch said flying means to fly and other side to play golf ball as conventional golf club does.

29. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27 of which said fit means and head means being screw means;

a screw means of said flying means being screwed on said a screw means of said head means of said club means;

said screw means of said flying means rotating and dangling on said screw means of said head means of said club means;

swiveling said club means, said flying means rotating outward due to said eccentric force, said rotating outward movement of said flying means unscrewing said flying means from said head means of said club means; said screw means of said head means of said club means transferring momentum to said flying means through said screw means of said flying means;

said screw means of said head means of said club means releasing engagement of said screw means of said flying means, said flying means taking off from said head means of said club means and flying in sky.

30. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27 of which said fit means being female screw and head means being male screw;

said female screw means being embedded in said flying means, it reducing air drag to said flying means to increase throwing distance of said flying means.

31. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, a light means and sound means being installed in the middle of said female screw, and said male screw being empty in the middle portion;

said light means and sound means being embedded in a cavity of said female screw not only to reduce air drag to increase throwing distance of said flying means but also having weight balance for said flying means.

32. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a golfball means,

Said golfball means comprising a ball means and a stick means,

said fit means being mounted on an end of said stick means, an other end of said stick means being inserted in said ball means;

swiveling said club means, due to eccentric force, said ball means and said stick means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said golfball means, said golfball means being thrown in the sky,

33. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a multi-boomerang means,

said multi-boomerang means further comprising multi-branches jointing together at a central joint,

said fitting means being mounted at said multi-boomerang means,



swiveling said club means, due to eccentric force, said multi-boomerang means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said multi-boomerang means, said multi-boomerang means being thrown to fly in the sky,

34. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a polygon boomerang means,

said boomerang means further comprising a plural of branches jointing together to form a polygon,

said fitting means being mounted at a joint of said branches.

swiveling said club means, due to eccentric force, said polygon boomerang means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said polygon boomerang means, said polygon boomerang means being thrown to fly in the sky,

35. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a disk means;

said fitting means of said flying means being mounted eccentric of said disk means.

swiveling said club means, due to eccentric force, said disk means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a

straight extension line of said club means, said directional lock and release mechanism releasing said disk means, said disk means being thrown to fly in the sky.

36. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a ring means.

said fitting means of said flying means being mounted eccentric on said ring means.

swiveling said club means, due to eccentric force, said ring means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said ring means, said disk means being thrown to fly in the sky.

37. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, a plastic injection module for said flying means comprising a screw module and a main plane cavity module, said screw module rotates to retrieve from said main plane cavity module before said plastic injection module being open.

38. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, said flying object being made of three composite material,

a main plane means of said flying means being made of the elastic material;

an exterior means of said flying means being made of soft material and

said fitting means being made of hard material.

39. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 39 further comprising a backbone plate means, said backbone plate

means being integrated with said fitting means and said fitting means and backbone plate means being made of hard material.

40. A sport means comprises of a flying disk means for being thrown to fly with a swivel of a club means by hands and said club means for being swiveled with hands to rotate said flying disk means and throwing said disk means to fly,

said club means being constituted of a pole means for being swiveled with hands in a circle to throw said flying disk means to fly and a head means for said flying disk means being pivotally mounted and said flying disk means being thrown out to rotate to fly in sky,

said flying disk means rotating and being thrown to fly in sky and a fitting means for said flying means being pivotally mounting on said head means of club means, said pivotally mounting being eccentric to said flying disk means that said flying means pivotally rotating due to an eccentric force of said swivel of pole means that said rotation of flying disk means being in parallel to a plane of said swivel of said club means, said fitting means being pivotally rotating on said head means and changing directional relation with said head means as said pole means being swiveled with hands; said flying means with said fitting means being pivotally mounted on said head means and having frictionless lock and release with said head means and being launched to fly with said head means based on said directional relation between said head means and fitting means;

said head means being located at an end portion of said pole means that said disk means being mounted at an end portion of said club means;

said flying disk means rotating due to said eccentric force of said swivel of club means that said fitting means pivotally rotating to an position to unlock said frictionless lock with said head means that said disk means being released and being launched to fly at said position;

said fitting means and head means not only serving as a pivotally rotation but also serving a directional lock and release; with a directional lock and release mechanism being embedded between said head means and fitting means, swiveling said pole means of said club means, said flying disk means automatically rotating toward outside of said circle due to said eccentric force, said automatically rotating of said flying disk means changing directional relation with said head means from said lock to release of said directional lock and release mechanism that said head means releasing said fitting means to launch said flying means to fly,

swiveling said club means in a circle with hand, said club means transferring momentum and an eccentric force to said flying disk means to rotate said flying disk means to a new direction to release said lock; with said momentum transfer, said eccentric force causing pivotal rotation and generating gyroscopic force to stabilize flying disk means flying and said pivotal rotation of said flying disk means causing said directional lock and release mechanism of said fitting disk means and head means from lock to release, said flying disk means being driven to fly in a long distance with a swivel of said club means.

## ABSTRACT

The golh sport is the golf hybrid of the golfrisbee and golfball. Swiveling the golh club, the golfrisbee or the golfball is thrown to fly. The golfrisbee has many types such as the boomerang, disk, diskring, ringdisk, multi-boomerang diskring and multi-boomerang ring disk, etc. The core technologies of the swiveling club throwing technology and the universal direction wing technology. All the series of the golh products are derived from the versatile combinations of these two key technologies. The golh system comprises the complete set for the course golh, park golh, snow golh, night golh, and the baseball type golh sport named as basedisk. Golh is the hybrid golf comprising the flying golfrisbee and the golfball. Basedisk is the golfrisbee sport following the similar game rules of baseball. To make the golh dream come true, the golh system comprises the golh club, sky-ballet golfrisbee, golh lubricant, golh cart, golh trolley, golh bag, golh swing trainer, and the manufacture processes to be an integrated system package. The sky-ballet golfrisbee further comprises a skirt to make it safe for playing in the park.



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for

**Golh: the Golf Hybrid Sport of Golfrisbee and Golfball**

**[Golh, Handisk & Basedisk System**

**of Sky-Ballet Golfrisbee for Course Golh, Snow Golh, Night Golh, Park Golh, Disk Golh]**

**Background Field of Invention**

Golh sports are the century sports for the 21st century. Golh is the golf hybrid of disk and ball. As shown in FIG.1, the disk in golh sport is referred to be golfrisbee. The ball in golh sport is referred to be golfball. The golh, handisk, and basedisk, etc are the new sports derived from our inventions golfrisbee and golfball. Both golfrisbee and golfball are derived from the same club-swiveling throw art. The golfrisbee [disk] or golfball is thrown into the sky [and spin fast] with the club swiveling. The golh sport comprises of a flying object being thrown to fly with a swivel

of a club by hand. The golh club is swiveled with hands to rotate the flying object and throw the flying object to fly. The golh club is constituted of a pole and a head. The pole is swiveled with hands in a circle to throw the flying object to fly. The club head is for the flying object to be pivotally mounted on it. The flying object is thrown out to rotate and fly. The golfrisbee throwing process is more like the sky-ballet. It looks beautiful just like the ballet dancer spinning on the stage. Therefore, we refer the golfrisbee to be the ballet in the sky. Our goal is to have the golh sports to be the Olympic sports. [Golf was invented for several centuries.] However, the golf is still not an Olympic sport yet. It is due to the original golf sport remaining as the sport for the rich people. [In the northern cold place, the golf is limited to be a game during the daytime of the weekend in the warm seasons only. However, in the weekend, many people need to go to church in the Sunday morning. Furthermore, the highflying golf ball is dangerous to people.] Due to safety reason, the golfers need to book for the tee-time to play. The rate of the usability of the huge golf course is very low. No wonder the golfing fees are high. Golf becomes the sport for the rich people only.

To change the situation, the golfrisbee is introduced to make the revolution in the golf sport of modern society. Now, the golfrisbee has made the breakthrough in golh technology. It will make the golh sport to be the sport for the people, not for the rich. As shown in FIG.1, [ B]based on the innovation of the golfrisbee, many sports are created accordingly such as golh, golfrisbee, golfball, basedisc, handisc, basketdisc, tenndisc, waterdisc, etc. A lot of new associations are formed such as Golh Association, Golfrisbee Association, Basedisc Association, Handisc Association, Basketdisc Association, Waterdisc Association, etc as shown in the web site <http://www.golfrisbee.com>. In the future, since the handisc and ice golfrisbee will be the popular

sport for people, golh have the potential to be the Olympic sport. Therefore, the golh will be the first Olympic sports of golf type sports.

As shown in FIG.1, golh is the hybrid golf sport made of flying golfrisbee, golfball and the rolling ball. Golfrisbee is to swivel[ing] club to launch flying disk to fly. Golfball is to swivel club to throw ball. In golh sport, the long drive adopts flying golfrisbee or golfball as shown in FIG.1; the putting adopts the basket for disk or the hole for golfball as shown in FIG.7. The golfrisbee has the soft-landing essential characteristics which it can play in the park to be the park sport. [In the golh sport, the golfball is strictly limited to roll on the ground such as putting the ball to roll into the hole.] [Because there is no flying golfball, so golh is relatively safe to be played in the park to be the Park Golh.] Even playing in the golf course, multiple groups of golhers can play at the same [hole] place without safety concern. Multiple groups of golhers share the golf course price. Golh does not need the tee-time. It reduces the golf course expense a lot.

The golh sports can be further divided to be

- (1) Course Golh;
- (2) Park Golh;
- (3) Disk Golh;
- (4) Snow Golh;
- (5) Ski Golh;
- (6) Night Golh;
- (7) Long-Drive Golh;
- (8) Basedisc;



(9) Other: such as Handisc, Ice Golfrisbee, Tennidisc, Basketdisc, Waterdisc, golh shooting, etc.

Golh can play in the golf course to be the course golh. There is the technology compatibility between the golfrisbee and golfball. Golh is the golf hybrid of disk and ball. In golf, the golf ball is hit with the swiveling golf club. In golh, the golfball is thrown with the swiveling golh club. For the course golh, there is no tee-time requirement for the golhers. The golher can play golh in the course any time and any place.

The high-flying golfball is dangerous. There is no golf in the park. However, the golfrisbee is safe, the golher can play golh in the public park. The golh played in the park is the park golh. Since the park golh and basedisk can play in the public park, the customer base for the park golh is huge.

[ T]As shown in FIG.1B, the basedisk is the conjugate sport of the baseball. Basedisc is to play golfrisbee according to the baseball game rules. The flying disk is the golfrisbee type basedisc launched with the golh club. The basedisc is smaller and heavier than golfrisbee. The basedisk flies as fast as the baseball.

Basedisk is the attacker swiveling the golfrisbee club to launch the disk to fly. The pitcher is no longer needed. The defenders catch the disk and pass the disk to touch the attacker. The rule is the same as the baseball. The flying disk for the golh and basedisk has innovations to fly long-range distance and is safe to operate.

[T]As shown in FIG.1A and FIG.1B, to play the basedisc or golh in the park, we need to have the portable base or portable-putting hole. The golh system pack includes the universal portable putting base for both the basedisc and park golh.

The handisk is the conjugate sport of the football. The handisk is to play the golfrisbee according to the football game rules. The disk is launched to fly with the hand or golh club.

[ T]As shown in FIG.1A, the [disk] golh is to play the golfrisbee in the disc golf course according to the [disk] golf rules. On the disk golf course, there are many baskets 18. The basket 18 is corresponding to the hole in the golf course. Disk golfers throw the flying disk into the basket 18 with the hand. Instead of using hand throwing disk, the golhers use the golh club 2 to launch the golfrisbee 1 to fly. Disk golh is the golher launching the golfrisbee to fly into the basket directly with the golh club. The hand-throwing disk golfers are our potential golh customers.

One of the golh target accounts is the golf course. However, to make the golfers and the golf courses to accept the golh sport, we need to provide the complete golh system package for the golh market strategy. At the beginning, to approach the golf course, the golh market strategy is to take the market share which the golfer cannot play the long drive. There are the places and times which the golfers cannot play the long drive such as the park, snow course and the time in the night. The golh can play the long drive in the golf course during the darkness in the night. To differentiate from the golf having no long driving capability, we mention the new snow golf and the new night golf having the long drive capability with golfrisbee to be the park golh, snow golh and night golh. To make the golfers and golf courses accept the golh sport, we promote the night golh and snow

golh. The night golh and snow golh can have the long drive with the flying golfrisbee and the putting with rolling golfball. The snow golh and night golh do not conflict with the existing golf sport activities. The snow golh and night golh can do the time sharing with golf for the same golf course.

Night golf is to play golf in the night. Night golf is the golf sport in the [southern hot] desert places. Why there is the need for the night golf? The first reason is that it is too hot to play golf during the daytime for the cities in the desert such as Las Vegas. The golfer has to wait until the temperature being cooled down in night. The night golf is the only golf which can be played in the hot desert. The second reason is that, in the weekdays, after the business hour, it is already 6 p.m. It becomes dark. If the golfer wants to play golf in the weekday, the night golf is the only choice. However, it is difficult to find the long drive flying golf ball in the night. The night golf is limited to be putting only!

On the contrary, the snow golh and ski golh are the golf sports for the [northern cold] snowy places. Snow Golf is the conjugate of the night golf. It is the golf in the [cold northern] snowy winter season. In 1893, the father of snow golf, Rudyard Kipling, started to putt the golf ball into the tin can. In 19<sup>th</sup> century, the USGA (United States Golf Association) already set the game rule for the snow golf. However, the snow golf cannot keep the snowy golf course to operate in the winter. After 110 years, the snow golf still cannot play the highflying golf ball game. It is impossible to have the long drive of the golf ball in the snowy golf course. It is hard to find the golf ball in the white snow[field] course. Therefore, the snow golf and night golf have the putting only.

Today the snow golf and the night golf already have the special rules and means. Both are the in-door golf activities to putting the golf ball to roll into the hole only. To have the long drive in night golf or snow golf, the LED and buzzer has to be installed on the golfball. However, as the golfball is hit with the impact of the golf club, the impact force will destroy the LED and buzzer. As the highflying golfball falls on the ground, the impact force will destroy the LED and buzzer installed in the golfball, too. Therefore, it is impossible to mount any signal indicator device on the golfball.

Why does the golf cost so much? The long drive of the golfball causes all the problems.

(i) The highflying golf ball is very dangerous that the golf cannot be played in the public park. It can only be played in the private golf course. Even in the private golf course, the highflying golf ball of the multiple groups of golfers will hit on each other and hurt each other. The golf cannot have multiple groups playing at the same time. For the safety reasons, golf has the 'tee-time' regulation. There is booking for the tee-time. At any time, only one group can play at one hole place of the golf course.

(ii) The long drive of golf cannot be played in the winter snow course. On the thick snow, there is no solid ground to place the tee. The golf ball has to be played on the snow directly. As the swiveling golf club hits the ball, the snow powders will sprays everywhere that you can not see where the golf ball flies. Even worse, as the highflying golf ball falls on the snow, the golf ball punches the snow pile and is buried in the snow. The golf ball disappears in the snow golf course. The golfer can never find the golf ball again until the snow melts in the next spring. So, there is no long drive in the snowy golf course. The golf course needs to shut down in the snowy winter season.

In 1893, the father of snow golf Rudyard Kipling introduced the snow golf which only had the putting golf ball to roll on the small area snow-clean ground activities. The snow golf does not have the long-range highflying golf ball activities. The snow golf is only in-house activities. It is no more the golf sport in the open field. The snow golf only has the putting activity. The snowy golf course still needs to shut down and lay off their employee. In the winter season, the snow golf only has the putting golf ball to roll into the hole activity. The golfer can putt in the house, not in the golf course. Today golf sport cannot play in the snowy golf course. In the winter season, the golf course is filled with snow. The highflying golf ball falls on to the snow and buried under the snow. It is impossible to find the golf ball that the golf game cannot play in the snowy golf course in the winter season. The golf course has to be shut down in the winter. The employee is laid off for 3 months to half year. The golf courses lost a lot of money.

(iii) The golf ball is hit by the golf club seriously. As the high flying golf ball falling and hitting on the solid ground, the impact is seriously. Even LED embedded in the golf ball will be destroyed in the hitting and impact processes. So, there is no night golf.

Since the golh club launches the sky-ballet golfrisbee as the human hand throws the flying disk. The soft-landing is the essential characteristics of the flying disk. So, there is no impact force applying to the flying disk in both the launching and landing process. We may embed the LED light in the sky-ballet golfrisbee to have the Night Golh.

The long drive of the golf ball causes no night golf, no snow golf, no park golf and booking for tee-time. It causes the usage of the golf course to be low. In the park, the city government pays the “green fee.” In the private golf course, the golfers need to pay the green fee for the green grass. It causes the high operation cost of the golf course.

The Golh adopts the flying disk to solve the snow golf problem.

(1) For the long drive of golh, there is no hitting impact force during the launching golfrisbee process. As the golfrisbee falls on the ground, the golfrisbee has the soft-landing characteristics. The golfrisbee has the enough lift force to carry the miniature LED, buzzer and battery. So, the LED and buzzer can be installed on the golfrisbee. The light and sound will lead the golher to locate and find the golfrisbee in the dark or in the snow very quickly.

(2) The sky-ballet golfrisbee is mounted on the golfrisbee club to launch to fly. The golfrisbee club does not contact with the snow powder at all. Therefore, the golher can see where the sky-ballet golfrisbee flies and lands.

(3) Due to the soft-landing of the sky-ballet golfrisbee, the sky-ballet golfrisbee will land on the top of the snow. The golher can identify the sky-ballet golfrisbee in the snow golf course easily.

(4) Due to safety of golfrisbee, the golf course can be as compact as a small park. The 18 hole paths can be folded as a net. The compact golf course can be located in the residential area, which is closed to the golfer customers. It is convenient and safe for the night gol[f]her.

Since the golfrisbee has the sound device and light device, the snow golh and night golh has the long Drive capability with golfrisbee. The golh can be played in the snowy golf course to be snow golh. The snow golf course just needs to blow the snow away from the putting hole area to clean out a small area for putting the golf ball. With the golh, the snowy golf course can continue operating in the winter season.

The golfrisbee can be played in the snowfield to be the ski golh. The ski golh is to play the golh with the cross-country ski. The snow golh and ski golh are referred as white golh. With the golfrisbee, in the shiny sunshine, the golher can play the white golh. The white golh has the different taste from the green golh. To play the white golh, we need to provide the auxiliary equipment. The complete system package includes the golh cart equipped with ski to play the ski golh.

Both snow golh and night golh have the high flying disk activity. Using the sky-ballet golfrisbee, the snow golh and the night golh have the complete golf course activity. The golh can boost up the golf course's income a lot. Definitely, the golf courses will welcome the golh for their own benefit [–] of the golf course's income. Due to the night golh, the golf course can operate at night in the weekday or in the hot desert. With the night golh, the golf course can continue operating during the night. After the office hours, the businessperson can eat dinner in the restaurant of the golf course. Then go to play the night golh. Due to the snow golh, the golf course can operate in the snowy winter. With the golh, the golf course can increase the operation time and no shutdown in the snowy winter. The golh can boost up the [economics] income of the golf course. The golf courses definitely encourage the golfer to adopt the golh club to play golh after it becoming dark or snowy. This is the win-win solution for the golf course and the golhers. It

reduces the golher's cost a lot, too. The member fee of the golf course will worth more. The golf course will sell the golh club and golfrisbee and encourage all the golfers to play golh in the night or in the snowy [course in the] days. To encourage the golfer to play the golh, they will allow the golhers to share the same course and no tee-time!

However, the night golh and the snow golh have the tough times and tough places to play. Therefore, we make the innovation in the golh system pack to meet the challenges of all the tough environments. We make the innovation in golh system technologies based on our invention of golfrisbee. We integrate the technologies and make the innovation in system integration to meet the technical challenges in park golh, night golh, ski golh and snow golh to promote the golh sports.

Eventually, as the golhers' population increases, the golh will be the dominant sport in the golf course. To play the golh in the golf course, the golh and golfrisbee technologies have to be compatible with the golf and ball technology. The swing of golh club is similar to the swing of golf club. The long-drive flying distance has to be compatible. As shown in the following table, the long drive flying capability of golfrisbee is about the same as flying golfball.

**Technology Compatibility between Golfrisbee & Golfball**

	Golfball	PDGA Disc	Aerobee Disc
the long drive record	1200 ft.	712 ft.	1257 ft
average	900 ft.		

Now the flying disk technology is comparable with the golf technology. The long-drive champion record for the golf ball is about 1236 feet. The hand-throw Aerobee Ring has the flying range



record to be 1257 feet. Therefore, the golfball and flying disk can be compatible to share the same golf course. Furthermore, we make the innovation for golfrisbee - the sky-ballet golfrisbee. The sky-ballet golfrisbee will make the flying disk flying [better –] higher and longer distance. With the sky-ballet golfrisbee, golh club and professional training with the golh swing trainer, almost all the people can launch the golfrisbee as well as and as far as the long drive of golf balls. From the following table of comparison, eventually the golh sport will be the dominant sport over the golf sport.

**Comparison Table for Golf & Golh**

Place/Time \ Sport		Golf	Golh/Golfrisbee
Golf Course	Tee-Time	Required	Not Required
	Cost	High	Low
City Park		Cannot Play	Can Play
Night		Only Putting	Long Drive & Putting
Weekday After Hours			
Desert		Cannot Play	Can Play
Snow Golf		Only Putting	Long Drive & Putting
Snow Golf Course			
Snow Field		Cannot Play	Can Play
Ski-Golf			
Disk Golf Course		Cannot Play	Can Play
Basedisk		Cannot Play	Can Play
Handisk, etc			

Furthermore, the way of golh swing is different from the way of golf swinging. There is the golh swing trainer to train the golfer to be the golher.

In golf, from long drive to putting, the golfer changes from wood club to steel club. The golfball does not change.

In golh, from long drive to putting, the golfer changes from golfrisbee to golf ball.

Golh is to introduce a complete system pack solution to the existing golf and flying disk problems. It offers the solution for the snow golf, night golf, park golf and disk golf. One unique golfrisbee disk will fulfill all the different tough requirements of the different golf sports. In addition, we need to provide the system pack solution.

The screw system of the golfrisbee cannot allow the dirt or sand to attach to it. We need to have the field cleaner to clean the sand and dirt away. Comparing with golf, the golh is a high-tech sport. To play good, you need to understand the mechanics, aerodynamics, etc. The most difficult problem is the initial static friction/stick force problem during the sky-ballet golfrisbee launching process. To swing consistently, each time the screw fit cap of the sky-ballet golfrisbee needs to be cleaned with blowing air and applied with lubricants of different viscosity. The static friction controller contains the compression air and lubricant.

The snow golf course and night golh courses are the tough play environment. We need special golh equipment for the snow golh and night golh. To play the snow golf in the snow golf

course, there are other issues needed to be addressed. To play the snow golf in the field, it is impossible to drag the heavy golf bag to walk on the soft snow in the cold windy golf course. We need a specially designed golf cart to carry the bag and the golfer altogether.

To carry the heavy golf bag to walk on the soft snow is not an easy job. For the golf course in the desert of Las Vegas, the snake and animal will come out in the night. We need to minimize the hazards in the snow golf and night golf. The golf bag is integrated with the personal portable golf cart. The golfer can ride on the personal portable golf cart in the golf course to minimize the hazards and speed up the play. As he arrives the disk-landing place, he can step down the golf cart, pop the support stick to support the golf cart as the standing golf bag. The golf cart will serve as the standing bag as you play the golf. As the golfer launches the sky-ballet golf frisbee disk, the golfer can immediately step on the golf cart to run after the flying disk.

### **Background-Description of Prior Art**

Golf is the national sport of US. It is the representative sport of the capitalism. It is the rich people's sport. However, it becomes the critics and hatred target of the poor people in the world. Before, we do not care. After 911, we must consider that it is time for us to change the style of the golf sport. After 911, all the Americans are confused why the other worlds hate us so much? Golf sport is the representative for the hatred and is attacked by the outside western and well-developed countries. For the poor people, the golf is the rich people's sport. One-round of 18-hole play cost at least \$30.00, even more. It is the month living fees of the poor people. With the addition of the caddy's fee, the poor people cannot imagine to join the golf sport in all his life. No wonder the golf represents the wealthy people's sport to be the hatred for the poor people. Due to the hatred caused

by envy, even the golf sport is so popular in US, however, the golf is still rejected to be the sport of the Olympic sport.

The snow golf is popular in the [northern] snowy place. The night golf is popular in the [southern] desert place. In the desert, it is very hot in the day. So, the night golf becomes popular. Both snow golf and night golf have golf limited to putting. There is no highflying golfball activity in the snow golf and night golf. The golfer cannot play the long drive in the nighttime or snowy field. As the golf club head hits on the golf ball, the LED, buzzer and battery embedded in the golf ball most likely will crack. As the highflying golf ball hits on the solid ground, the LED, buzzer and battery most likely will crack, too.

Both basedisk and golh are the new sports based on the innovation of the golfrisbee. The basedisk is the golfrisbee adopting the baseball game rule. The golh is the hybrid sport constituted of the flying golfrisbee and [rolling] golfball. The golh can play in the park to be the park golf. Golh is the park golf which is safe to play in the park. It is invented for the Olympic golf sport. You cannot play the golf in the park. However, you can fly disk in the park. The golh can be played in the park as the flying disk being played in the park. As the object flying in the sky, it is the flying disk. As the object rolling on the ground, it is the rolling ball. From long drive to putting, the golher changes the golfrisbee to be the golf ball. In golh, the golher does not change club. The same club can either launch the golfrisbee or putt the golfball. The LED and battery can be embedded in the flying disk. Because the golh club does not hit on the flying disk and the flying disk has the soft landing, the LED and battery will be left unharmed. You can play golh in the snow golf course. The flying disks will softly land on the top of the snow pile.

Furthermore, the golh can have the multiple groups to share the golf course at the same time. The multiple groups share the same tee-time. There is no need to reserve the tee-time anymore. Golh reduces the cost a lot for the member and increases the income of the golf course. It is the new golf standard which can play the golf in the snowy golf course. For the golh and basedisk sports, the golfrisbee completely changes the [world value] image about the golf with the flying disk technology. It will save the American from the hatred and attacks of the terrorism.

Golh will save the golf course in the winter season. The golf course can continue operating in the winter season. Accordingly, the innovations of golh and golfrisbee are not only in the golf technology and flying disk technology but also in the way of sporting system integration. Without the innovation of the sporting system integration, the golh sport will not be functional properly.

The golh is [technologically] compatible to golf. The long drive of flying disk is compatible to the long drive of golf ball. The Guinness World Record set Aerobie Pro Ring (US patents 4,560,358 and 4,456,265) to be the world's farthestmost thrown object 1,257 feet. Actually, it is not the dome-shaped flying disk. It is a flat plate with ring shape. There are two reasons for the ring plate structure to be the farthestmost thrown object. The first is the thin profile of the ring plate; the second is the long-range stability. The thin profile has the low drag force. The long-range stability is due to the side [edge] stability of the spoiler rim to keep the straight flight. However, the side stability causes the Aerobie Ring not having the dogleg curving flying capability. The dogleg flying capability is emphasized in the disk golf course. Furthermore, the inclined edge of the spoiler rim induces the drag at the front and end edges that the throwing distance is reduced. The

thin plate is without the proper protection. It easily hurts the other people. The flat plate ring is not safe to play in the park.

To make the flying disk to have the thin profile is not easy. The Aerobie Superdisc is the flying disk version of the Aerobie Pro Ring. However, Aerobie Superdisc no longer keeps the thin profile of the ring structure. The Aerobie Superdisc has the inclined curved edge with the dotted surface to increase the friction for handholding. At the edge, it has the spoiler rim for stable flight. The spoiler rim is more like the upright directional wing of the airplane or the damping board of the boat. However, it induces many other drawbacks. At the leading edge, the spoiler rim will induce the separation of the boundary layer on the top of the flying disk. At the tailing edge, the spoiler rim will induce the separation of the flow from the soft cushion tail fin. Comparing to the Aerobie Pro Ring, the hand-thrown distance of Aerobie Superdisc is reduced a lot.

The US patent 4,568,297 of Innova disk has the flying range of 712 ft. It is a flying disk approved by the Professional Disc Golf Association (PDGA). The hand-thrown flying disk has the vertical sharp edge for handholding. The sharp vertical straight edge introduces a lot of drag. Outside the vertical sharp edge is the triangular design of the supersonic airfoil. However, the hand-thrown flying disk is always operating in the subsonic speed range. It is not a correct design for the front edge. The triangle is tilt upward. It is not correct design for the tail end, either. The speed of flying disk is much less than the sonic speed. For the subsonic airfoil design, it does not need the triangle. At the head side, the sharp edge does not have the supersonic effect. However, at the tail side, the vertical edge and the upward slope of the triangular design causes the separation of the airflow from the tail fin. It induces a lot of drag to the flying disk. Due to the vertical sharp-

edge, Innova Disk has to be thrown horizontally. Even worse, the sharp edge of triangular design causes the Innova disk to be unsafe for the park sport. Originally, the flying disk has the benefit to play in the park safely. However, the Innova disk destroyed the park sport benefit. The Innova disk is small and heavy with the sharp edge. The Innova disk is dangerous to the public that it cannot be played in the public park. Just like the golf ball is forbidden in the park, the disk golf is forbidden in the park, too. The disk golf is no more a “park sport.” Just like the golf, the disk golf needs to play in the “disk golf course.”

The drag force determines the flying distance. The wobbling phenomena and the abrupt shape are the most important two aerodynamic drag factors. To eliminate the wobbling, the structure of golfrisbee is symmetrical. To reduce the drag force, the golfrisbee shape is further smooth[en]ed. The essential difference between the sky-ballet golfrisbee and the conventional hand-thrown flying disk is that the sky-ballet golfrisbee gets rid of all the sharp edges. It has no edge at all. The sky-ballet golfrisbee has the dome shape smooth design in its middle portion. The sky-ballet golfrisbee with the skirt is safe to play in the park. It is the only flying disk having both the thin profile of the ring structure and the dome shape of the flying disk. The golfrisbee is launched with the golf club. The screw of golh club head is about half turn only. It makes the sky-ballet flying disk being able to have very thin profile. Since the sky-ballet golfrisbee is not thrown with hand, it has no edge designed for the hand holding and throwing. The sky-ballet golfrisbee is launched with the golh club, it does not need the hand holding vertical edge of flying disk. It has the smoothly curved design in the middle portion of the bottom of sky-ballet golfrisbee. The skirt introduces the side stability without the loss of the dog-leg fly capability. The skirt further has the bumper design to play safe in the park. Furthermore, the skirt serves as the bumper to protect the

people from being hit. The skirt made of the foam material has the opening space between the golfrisbee main [body] plane and the skirt. The skirt of the golfrisbee has the function of the long range stability of the spoiler rim; however, the skirt does not have the drag caused by the spoiler rim. Theoretically, the farthest distance comes from throwing angle at 45 degrees, not throwing level. The sky-ballet golfrisbee has no edge that it can launch at any angle. With the aerodynamic smooth airfoil design, thin ring structure and launching with the golh club, the sky-ballet golfrisbee will be the new Guinness World Record to set sky-ballet Golfrisbee to be the “Manpower throwing” World’s farthest thrown object.

The golh needs to play as the snow golh and the night golh. It is impossible for the golher to pull the golf trolley in the deep snow. It is extreme dangerous to walk in the dark field. The golh cannot use the existed golf facilities to play the snow golh or night golh. The golf never plays in the snow field or the dark field. The golf cart, golf trolley or golf bag is not designed for the snow golf or night golf. The golf cart is a four wheels electrical car. The golf trolley cannot carry golfer. The golf bag is too heavy to be used on the soft snow. Therefore, the golf cart or golf trolley is not capable to work in the snow field and the dark field. In the snow field and the dark field, the golh trolley has to be integrated with the golh cart and be able to carry the golher. The Dean L. Kamen et al’s patents US5, 971,091 Transportation Vehicles and Methods and US6,302,230B1 Personal Mobility Vehicles and Methods do not have the trolley function of golh cart. Our new innovative golh cart is unique to have the multiple functions of the golh bag, golh trolley and golh cart. The golh cart is similar to the two-wheel golf trolley. However, the golher can ride on the golh cart.



The golf swing trainer provides guidance for the [path] correct way of the swing of the golf club. Our golh swing trainer not only guides the swing path but also guides the swing speed and swing acceleration. The golher swing trainer integrates both the weight training and swing training in the same swing trainer.

## **Objects and Advantages**

The sports of golh, snow golh, ski golh, night golh, park golh, disk golh and basedisk are the golh sport family which is derived from our invention of the sky-ballet golfrisbee. We provide the complete system packs solution for the golfrisbee sport family. The system pack includes the sky-ballet golfrisbee, golh club, portable hole base, static friction lubricant, swing trainer, self-lock golh bag, and golh cart. The cost of golh and basedisk are reduced with the integrated manufacturing process. It becomes the sport for the people. The golh, ski golh and basedisk, etc will be the first golf type sports to be the official Olympic Sports and Winter Olympic Sports.

## **Drawing Figures**

FIG. 1 is the golh sport being constituted of the golfrisbee and golfball. Swiveling the golh club, the golfrisbee is thrown into the golh basket and the golfball thrown to the hole; (B) the sport of basedisk is the golfrisbee being played as the baseball does; (C) is the golh sport being played as the shooting arrow does.

FIG.2 is elevational view of mounting the golfrisbee on the golh club; (A) the golfrisbee is engaged with the head of the golh club; (B) rotating the golfrisbee 180 degrees, the golfrisbee

being locked and free dangling mounted on the head of golh club; (C) the golfball is engaged with the head of the golh club; (B) rotating the golfball 180 degrees, the golfrisbee being locked and free dangling mounted on the head of golh club.

FIG.3 is the top view of swiveling golh club to launch the golfrisbee and golfball; (A) after mounting the golfrisbee on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee; (B) swiveling forward to launch the golfrisbee; (C) the golfrisbee takes off and flies in the sky; (D) after mounting the golfball on the golh club, swiveling backward to the position to be ready to swivel forward to throw the golfball; (E) swiveling forward to throw the golfball; (F) the golfball is thrown in the sky.

FIG.4 The rotating mechanism of mounting and launching golfrisbee and golfball; (A) engaging the golfrisbee with the head of golh club; (B) rotating golfrisbee 180 degrees that the golfrisbee hangs and dangles on the head of the golh club; (C) swiveling the golh club, the golfrisbee rotates and launches from the head of golh club.

FIG.5 is the dynamics of the golfrisbee at the launching point.

FIG.6 The dynamic study of the launching angle of the golfrisbee; (A) the angle position that golfrisbee is too early to launch properly; (B) the optimum angle to launch the golfrisbee; (C) the angle position that golfrisbee is too late to launch properly.

FIG.7 Putting the golfrisbee and golf ball ; (A) putting a golf ball into the portable hole; (B) putting the golfrisbee to roll into a cave.

FIG. [1]8 is the sky-ballet golfrisbee and golfball; (A) is the side view of the golfrisbee disk; (B) is the side view of the golfball; ([B]C) is the right-hand golfrisbee club; ([C]D) is the left-hand golfrisbee club.

FIG.[2]9 is the section view of the sky-ballet golfrisbee and golfball; (A) is the side section view of the golfrisbee disk; (B) is the side section view of the golfball; ([B]C) is the section view of the right-hand golfrisbee club; ([C]D) is the section view of the left-hand golfrisbee club.

FIG.10 The fundamental principles of the innovation of the universal directional flying wing of the golfrisbee; (A) is the conventional wing flying in the forward direction; (B) is the conventional wing flying in the backward direction; (C) is the overlap of the conventional wings flying in forward direction and the backward direction as shown in FIG.10A and FIG.10B; (D) is the bidirectional flying wing having the bidirectional flying capability which is the composition of the overlap of the uni-directional flying capability of the conventional wings; (E) is the conventional wing with the slat and flap flying in the forward direction; (F) is the conventional wing with the slat and flap flying in the backward direction; (G) is the overlap of the conventional wings with the slat and flap flying in forward direction and the backward direction as shown in FIG.10E and FIG.10F; (H) is the bidirectional flying wing with the slat and flap having the bidirectional flying capability which is the composition of the overlap of the uni-directional flying capability of the conventional wings.

FIG.11 The application of the bi-directional flying wing to the design of the golfrisbee disk having the disk shape with the universal directional flying capability; (A) is the sectional view of

the golfrisbee having the sectional view of the bi-directional wing.; (B) is the isometric view of the golfrisbee disk; (C) is the aerodynamic analysis for the golfrisbee.

FIG.12 The application the bi-directional flying wing to the design of the golfrisbee ring having the ring shape with the universal directional flying capability; (A) is the sectional view of the golfrisbee ring having the sectional view of the bi-directional wing.; (B) is the isometric view of the golfrisbee ring.

FIG.13 The application the bi-directional flying wing to the design of the golfrisbee disk ring having the hybrid of disk and ring shape with the universal directional flying capability; (A) is the sectional view of the golfrisbee diskring having the sectional view of the bi-directional wing.; (B) is the isometric view of the golfrisbee disk ring.

FIG.14 The golh uses the golh club to throw the golfball; (A) is the golfball being thrown with the golh club as shown in FIG.14D; (B) is the section view of the golfball with the fast release latch; (C) is the golfball with the arrowhead; (D) is the golh club being swiveled to throw golfball and launch the golfrisbee to fly.

FIG.15 is the application of the golh club to throw the boomerang; (A) is the sectional view of the boomerang with the adaptor to be thrown with the golh club; (B) is the top view of the boomerang with the adaptor to be thrown with the golh club; (C) is the sectional view of the boomerang with the bi-directional wing segment to be thrown with the golh club; (D) is the top view of the boomerang with the bi-directional wing segment to be thrown with the golh club;

(E) after mounting the golfrisbee on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of boomerang; (F) swiveling forward to launch the golfrisbee made of boomerang; (G) the golfrisbee made of boomerang takes off and flies in the sky.

FIG.16 is the application of the golh club to throw the odd-boomerang and even-boomerang; (A) is the sectional view of the multi-boomerang with the adaptor to be thrown with the golh club; (B) is the top view of the odd-boomerang with the adaptor to be thrown with the golh club; (C) is the top view of the even-boomerang with the adaptor to be thrown with the golh club; (D) is the sectional view of the odd-boomerang with the bi-directional wing segment to be thrown with the golh club; (E) is the top view of the odd-boomerang with the bi-directional wing segment to be thrown with the golh club; (F) is the top view of the even-boomerang with the bi-directional wing segment to be thrown with the golh club; (G) after mounting the golfrisbee made of tri-boomerang on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of tri-boomerang; (H) swiveling forward to launch the golfrisbee made of tri-boomerang; (I) the golfrisbee made of tri-boomerang takes off and flies in the sky.

FIG.17 is the application of the golh club to throw the polygon-boomerang; (A) is the sectional view of the polygon-boomerang with the adaptor to be thrown with the golh club; (B) is the top view of the polygon-boomerang with the adaptor to be thrown with the golh club; (C) is the sectional view of the polygon-boomerang with the bi-directional wing segment to be thrown with the golh club; (D) is the top view of the polygon-boomerang with the bi-directional wing segment to be thrown with the golh club; (E) after mounting the golfrisbee made of triangle-boomerang on

the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of triangle- boomerang; (F) swiveling forward to launch the golfrisbee made of triangle- boomerang; (G) the golfrisbee made of tri-boomerang takes off and flies in the sky.

FIG.18 is the application of the golh club to throw the universal directional flying wing golfrisbee disk; (A) is the sectional view of the universal directional flying wing golfrisbee disk with the screw adaptor to be thrown with the golh club; (B) is the top view of the universal directional flying wing golfrisbee disk with the adaptor to be thrown with the golh club; (C) is the sectional view of the universal directional flying wing golfrisbee disk with the universal directional wing segment to be thrown with the golh club; (D) is the top view of the universal directional flying wing golfrisbee disk with the universal directional wing segment to be thrown with the golh club; (E) after mounting the golfrisbee made of disk on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee made of disk; (F) swiveling forward to launch the golfrisbee made of disk; (G) the golfrisbee made of disk takes off and flies in the sky.

FIG.19 is the application of the golh club to throw the universal directional wing golfrisbee ringdisk; (A) is the sectional view of the golfrisbee ring with the screw adaptor to be thrown with the golh club; (B) is the top view of the golfrisbee ring with the screw adaptor to be thrown with the golh club; (C) is the sectional view of the golfrisbee ringdisk with the universal directional wing segment to be thrown with the golh club; (D) is the top view of the golfrisbee ringdisk with the universal directional wing segment to be thrown with the golh club; (E) after mounting the golfrisbee ringdisk on the golh club, swiveling backward to the position to be ready to swivel

forward to launch the golfrisbee ringdisk; (F) swiveling forward to launch the golfrisbee ringdisk;  
(G) the golfrisbee ringdisk takes off and flies in the sky.

FIG.20 is the application of the golh club to throw the golfrisbee diskring; (A) is the  
sectional view of the golfrisbee diskring with the screw adaptor to be thrown with the golh club;  
(B) is the top view of the golfrisbee diskring with the screw adaptor to be thrown with the golh  
club; (C) is the sectional view of the golfrisbee diskring with the universal directional wing  
segment to be thrown with the golh club; (D) is the top view of the golfrisbee diskring with the  
universal directional wing segment to be thrown with the golh club; (E) after mounting the  
golfrisbee diskring on the golh club, swiveling backward to the position to be ready to swivel  
forward to launch the golfrisbee diskring; (F) swiveling forward to launch the golfrisbee diskring;  
(G) the golfrisbee diskring takes off and flies in the sky.

FIG.21 is the application of the golh club to throw the golfrisbee multi-boomerang ringdisk  
and diskring; (A) is the partial exposed elevational view of the golfrisbee multi-boomerang  
ringdisk and diskring with the screw adaptor to be thrown with the golh club; (B) is the top view of  
the golfrisbee odd-boomerang ringdisk and diskring with the screw adaptor to be thrown with the  
golh club; (C) is the top view of the golfrisbee even-boomerang ringdisk and diskring with the  
screw adaptor to be thrown with the golh club; (D) is the partial exposed elevational view of the  
golfrisbee multi-boomerang ringdisk and diskring with the universal directional wing segment to  
be thrown with the golh club; (E) is the top view of the golfrisbee odd-boomerang ringdisk and  
diskring with the universal directional wing segment to be thrown with the golh club; (F) is the  
top view of the golfrisbee even-boomerang ringdisk and diskring with the universal directional

wing segment to be thrown with the golh club; (G) is the top view of the golfrisbee with the arrowhead; (H) after mounting the golfrisbee made of multi-boomerang ringdisk and diskring on the golh club, swiveling backward to the position to be ready to swivel forward to launch the golfrisbee tri-boomerang ringdisk and diskring; (I) swiveling forward to launch the golfrisbee made of multi-boomerang ringdisk and diskring; (J) the golfrisbee made of multi-boomerang ringdisk or diskring takes off and flies in the sky.

FIG.22 is the implementations of the golfrisbee boomerang ringdisk and diskring; (A) is the partial exposed elevational view of the golfrisbee boomerang ringdisk or diskring with the screw adaptor to be thrown with the golh club; (B) is the sectional view of the golfrisbee boomerang diskring with the universal directional wing of disk type; (D) is the golfrisbee boomerang ringdisk with the universal directional wing.

FIG.23 is the section view of the sky-ballet golfrisbee which is the boomerang diskring as shown in FIG.[1]8A; (A) is the bottom view of the sky-ballet golfrisbee taken at the horizontal line X-X in FIG.23B; (B) is the horizontal section view of the sky-ballet golfrisbee taken at the horizontal center line in FIG.23A; (C) is the vertical section view of the sky-ballet golfrisbee taken at the vertical center line Y-Y in FIG.23A; (D) the boomerang polygon derived from the combination boomerangs of FIG.16 and FIG.17 is similar to the boomerang disk ring; (E) the boomerang polygon golfrisbee has the same structure as FIG.23A; the sky-ballet golfrisbee is the edge numbers of polygon to be infinite.



FIG.24 is the section view of the sky-ballet golfrisbee having the punched through fitting screw cap and the boomerang wing segment with the adjustable angle of attack ; (A) is the bottom view of the sky-ballet golfrisbee taken at the horizontal line W-W in FIG.24B; (B) is the horizontal section view of the sky-ballet golfrisbee taken at the horizontal center line in FIG.24A; (C) is the vertical section view of the sky-ballet golfrisbee taken at the vertical center line Z-Z in FIG.24A.

FIG.25 is the section view of the sky-ballet having the ring shape; (A) is the bottom view of the sky-ballet golfrisbee; (B) is the horizontal section view; (C) is the vertical section view.

FIG.26 is the section view of the sky-ballet golfrisbee with the exchangeable screw cap and weight-balanced design; (A) is the bottom view of the sky-ballet golfrisbee; (B) is the horizontal section view; (C) is the vertical section view.

FIG.27 is the golfrisbee static friction controller which has the functions of air compressor, air cleaner and lubricant[ion]; (A) is the golfrisbee static friction controller at the idle position; (B) is the golfrisbee static friction controller in the air compression mode; (C) is the golfrisbee static friction controller at the air cleaning mode; (D) is the golfrisbee static friction controller in the lubrication mode.

FIG.28 is the airfoil shape of the golfrisbee boomerang wings; (A) is the section view of an airfoil for the lift-upward motion with right hand rotation; (B) is the section view of an airfoil for the lift-up motion with left hand; (C)) is the section view of an airfoil as shown in FIG.10D for the lift-upward motion; (D) is the section view of an airfoil for the diving-downward motion with right hand rotation; (E) is the section view of an airfoil for the diving-downward motion with left hand rotation; (F) is the section view of an airfoil for the diving-downward motion.

FIG.29 is the two-wheel golh trolley; (A) is the two-wheel golh-pulling trolley; (B) is the integrated two-wheel golh trolley with the golh bag; (C) is the ski type golh trolley; (D) is the belt type golh trolley.

FIG.[1]30 is three-wheel type foldable and portable personal golh cart; (A) is the side view of the personal golh cart; (B) the personal golh cart stands as standing bag; (C) is the back view of the personal golh cart; (D) is the side view of the personal golh cart having the snow ski; (E) is the personal golh cart having the snow ski stands as stand-up bag; (F) is the back view of the personal golh cart having the snow ski.

FIG.[1]31 is two-wheel type foldable and portable personal golh cart; (A) is the side view of the personal golh cart; (B) is the personal golh cart stands as standing bag; (C) is the back view of the personal golh cart; (D) is the side view of the personal golh cart having the automatic ski capability; (E) is the personal golh cart having the automatic ski capability and also serving as standing bag; (F) is the back view of the personal golh cart having the automatic ski capability.

FIG. [1]32 shows the operation of the automatic ski system; (A) is on the hard ground, the ski is not engaged with the ground; (B) is the detailed mechanism of the automatic ski not engaged with the ground as shown in FIG.[1]31A; (C) is on the soft ground, the ski is engaged with the ground; (D) is the detailed mechanism of the automatic ski engaged with the ground as shown in FIG.[1]31C.

FIG. [1]33 shows the operation of the fast installment of the ski shoes of the golh cart; (A) is the shaft of wheel fed into the notch on the ski frame; (B) is the shaft of wheel fed into the guided slot of ski shoe; (C) the lock plate is closed to have the shaft of wheel sealed in the slot; (D) the hook of the spring is mounted on the shaft to have the automatic bias of the automatic operation of the snow ski.

FIG. [1]34 is the snow ski having the elongated guiding slot to have snow ski to be packed.

FIG.[1]35 is the snow wheel; (A) is the snow wheel rolling on the solid ground; (B) is the snow wheel rolling on the snow.

FIG. [1]36 (A) is the section view of the integrated waterproof LED light for sky-ballet golfrisbee; (B) is the top view of the integrated waterproof LED light for sky-ballet golfrisbee.

FIG. [1]37 (A) is the section view of the integrated waterproof sound generator for sky-ballet golfrisbee; (B) is the top view of the integrated waterproof sound generator for sky-ballet golfrisbee.

FIG. [1]38 is the partial section view of the self-locked golh bag; (A) the cap of the self-locked golh bag is in the locked position; (B) the cap of the self-locked golh bag is uncapped and is self-locked at the bottom of the bag.

FIG.[1]39 is the portable base for the golh putting and basedisc.

FIG.[2]40 is golh super swing trainer; (A) is the isometric view of the golh super swing trainer; (B) is the side view of the golh super swing trainer; (C) is the guide implemented with the gear for the golfrisbee club; (D) is the guide implemented with the steel rope for the golfrisbee club.

FIG.[2]41 is the golh simulator.

FIG.[2]42 is the working flow of the golfrisbee disk and golfrisbee hut; (A) the module process for golh club and golfrisbee; (B) the assembly flow for the golh club and golfrisbee.

FIG.43 The plastic injection module for the golfrisbee with double injection; (A) the plastic injection of the elastic material for the main plane which include the screw adaptor; (B) the retrieve and rotation of the screw module; (C) the open of the injection modules, the golfrisbee without distortion is formed.

FIG.44 The golfrisbee design for the plastic injection module for triple injection; (A) is the top view of the golfrisbee disk; (B) is the top view of the golfrisbee diskring made of three different plastic material; (C) is the sectional view of the golfrisbee diskring made of three different plastic material.

FIG.45 The plastic injection module for the golfrisbee with triple injection; (A) the plastic injection of the elastic plastic material for the main plane; (B) as the modules open, the pore for the screw is formed; (C) the plastic injection of the hard plastic for the screw; (D) as the modules open, the screw is formed.

FIG.46 The plastic injection for the skirt which can be integrated with the double injection or triple injection; (A) the plastic injection of the soft skirt plastic material; (B) the modules open and the completed golfrisbee is formed.

FIG.47 The golfrisbee design for the plastic injection module for triple injection of golfrisbee with backbone plate; (A) is the top view of the golfrisbee disk with backbone plate; (B) is the top view of the golfrisbee diskring with backbone plate made of three different plastic material; (C) is the sectional view of the golfrisbee diskring with backbone plate made of three different plastic material.

FIG.48 The plastic injection for the backbone plate which can be integrated with the double injection or triple injection; (A) the plastic injection of the hard backbone plastic material; (B) the plastic injection for the main body of golfrisbee with the backbone plate being embedded.

## **Description and Operation**

As shown in FIG.1A, the golh is the hybrid golf sport constituted of golfrisbee 1 and golfball 15. The golh sport is to swivel the golh club 2 to launch the golfrisbee 1 to fly and throw the golfball 15. The golfrisbee 1 is to be thrown into the golfrisbee basket 18 with the golh club 2. The flag 18f is mounted at the top of the golfrisbee basket 18. The flag is not only to mark the destination and basket/hole number but also the indication of the wind direction and wind speed. The golh player needs to adjust the way to throw the golfrisbee to compensate the influence of the wind direction and wind speed. The golfball 15 is to thrown to the hole then put the ball 151 to roll into the hole or portable hole 6 with the golh club. The golh is the long drive of golf playing with the golfrisbee disk 1 and golfball 15. The flying distance of the golfrisbee 1 is compatible with the golfball 15. For the conventional flying disk, the flying distance is much less than the golfball 15 and the conventional golf ball. Therefore, the golfrisbee 1 has the special design to have the long range flying capability. All the shape of the sky-ballet golfrisbee 1 has the streamline design for integrity. There is no abrupt line segment or sections as most of the flying disk and ring do. With the golh club 2, it will be the human power farthest throw in the world to be the new Guinness world record 1257 feet. Furthermore, the golfrisbee 1 is designed to be safe to play as the conventional flying disk does.

As shown in FIG.1B, the golfrisbee can play as the baseball does and it referred to be the basedisk. The attacker 111 swivels the golh club 2att to launch the golfrisbee 1att and runs. The defender catches the golfrisbee 1att then swivels the golh club 2def to launch the golfrisbee 2def to block the attacker 111. For the basedisk, the baseball is replaced with the golfrisbee disk. The sporting rules of basedisk are similar to the sporting rule of baseball. FIG.1C shows the golh sport can play as the arrow shooting gain. Swiveling the golh club, the golfball type arrow 15a or the golfrisbee type arrow 1a is shot at the target 18a.

FIG.2 is an elevation view of the mounting operations of the golfrisbee 1 and golfball 15.  
As shown in FIG.2A, the golfrisbee 1 is mounted on the head 11 of golh club 2. Then the  
golfrisbee 1 is rotated 180 degrees to dangle on the head 3 of golh club 2 as shown in FIG.2B. As  
shown in FIG.2C, the golfrisbee 1 is mounted on the head 3 of golh club 2. Then the golfrisbee 1 is  
rotated 180 degrees to dangle on the head 3 of golh club 2 as shown in FIG.2D.

FIG.3 is the top view of the swiveling operations of the golfrisbee 1 and the golfball 15. As  
shown in FIG.3A, the golh club 2 is swiveled back to be ready to throw the golfrisbee 1. As shown  
in FIG.3B, due to the eccentric force, the golfrisbee 1 rotates. As shown in FIG.3C, the golfrisbee 1  
takes off and flies in the sky. As shown in FIG.3D, the golh club 2 is swiveled back to be ready to  
throw the golfball 15. As shown in FIG.3E, due to the eccentric force, the golfball 15 rotates. As  
shown in FIG.3F, the golfball is thrown in the sky.

From FIG.4 to FIG.6, the mechanics of the golh club operations are analyzed in details. FIG.5  
is to illustrate the most important principle of the golh sport – the mounting golfrisbee position is  
the same as the launching golfrisbee position at the vertical straight extension line of the golh club.  
FIG.4A shows the golfrisbee 1 is mounted on the head of the golh club 2 at the extension of the  
vertical straight line of the golh club 2. FIG.4B shows the golfrisbee 2 rotates 180 degrees and  
dangles on the head of golh club 2. FIG.4C shows the golfrisbee rotates 180 degrees due to the  
eccentric force of the swiveling circle of golh club 2 and launches to fly at the same position of the  
mounting golfrisbee 1.

The golfrisbee 1 is one kind of the flying object only. The golh club can be used to throw  
many different flying objects such as disk, ring, boomerang, etc. The fitting screw for flying

object is pivotally mounting on the club head of golh club 2. The pivotal mount is eccentric to the flying object. The flying object pivotally rotates due to the eccentric force induced by the swivel of club 2. As shown in FIG.3, the rotation of flying object is in parallel to a plane of the swivel of the golh club. The fitting screw 13 is pivotally rotating on the club head 34 as the golh club 2 is swiveled with hands. The flying object with the fitting screw 13 is pivotally mounted on the club head 34. The fitting screw 13 has frictionless lock and release with club head 34. The flying object is launched to fly with club head 34 based on the directional relation between the club head 34 and fitting screw 13. The club head 34 is located at an end portion of the pole that flying object is mounted at an end of the club 2. The flying object rotates due to the eccentric force of the swivel of club 2 that the fitting screw 13 pivotally rotates to an position to unlock the frictionless lock with the golh club head 34. The flying object is released and launched to fly at the release position.

The fitting screw 13 and club head 34 not only serves as a pivotally rotation but also serves as a directional lock and release. With the directional lock and release mechanism being embedded between the club head 34 and the fitting screw 13, swiveling the pole of golh club 2, said flying object automatically rotating toward outside of the swiveling circle due to the eccentric force. The automatically rotating of the flying object changing directional relation with the club head 34 from the lock to release of the directional lock and release mechanism. The head 34 releases the fitting screw 13 to launch the flying object to fly,

FIG.5 shows the dynamics of the swiveling golh club 2 at the launching point. At the launching position, the golfrisbee 1 has the tangential velocity  $V$  and the angular momentum  $M$ . As shown in FIG.3, swiveling the golh club 2 in a circle with hand, the golh club 2 transfers

momentum and an eccentric force to the flying object to rotate the flying object to a new direction to release the lock. With the momentum transfer, the eccentric force causes the pivotal rotation and generates gyroscopic force to stabilize flying object flying. The pivotal rotation of the flying object causes the directional lock and release mechanism of fitting screw 13 and club head 34 from lock to release. The flying object is driven to fly in a long distance with a swivel of the golh club 2.

FIG.6 illustrates the selection of the optimum launching point. As shown in FIG.6A, if the golfrisbee 1 launches before it arrives the vertical straight more than 5 degrees, it is too early to launch the golfrisbee 1. As shown in FIG.6B, if the golfrisbee launches at 5 degrees before it arrives the extension line of the golh club 2, it is the optimum point to launch the golfrisbee 1. As shown in FIG.6C, if the golfrisbee launches after it arrives the vertical straight line, it is too late to launch the golfrisbee 1.

FIG.7 shows the swiveling golh club 1 to put the ball and golfrisbee to roll. The head golh club 2 is in the shape of the head of golf club. A side of the golh club head is to launch the flying objects to fly and the other side is to put the ball 151 as conventional golf club does. FIG.7A shows the ball being put with club 2 to roll into a universal portable hole 6. FIG.7B shows the golfrisbee 1 seats on the universal portable hole and is put with golh club 2 to roll into a portable hole 6.

FIG.8 and FIG.9 show the basic golh set which includes the golfrisbee 1, golfball 15 and golh club 2. As shown in FIG.[1]8, it shows the set of the sky-ballet golfrisbee. The golfrisbee has two kinds of design. As shown in the FIG.23, it shows the helicopter type boomerang wing segment



17. As shown in FIG.25, it shows the UFO disk type design. The sky-ballet golfrisbee 1 has a skirt 16. The skirt 16 has several functions.

- (1) It serves as the bumper to protect both human and the golfrisbee itself. The skirt is made of the soft material such as foam rubber. The skirt 16 has the skirt hanger 161 extended into the sky-ballet golfrisbee body.
- (2) The skirt 16 serves as the stabilizer at the side of the golfrisbee for the long range flight as the empennage does. At the front of the golfrisbee, the skirt 16 serves as the guiding slot to guide the air flowing above the golfrisbee as the slot slat does. It reduces the drag force at the front end. This design is the subsonic airfoil design. It is completely different from the Innova Disk. The Innova Disk has the triangle front end being the supersonic airfoil design. However, for the supersonic wing operates at the subsonic speed, it induces a lot of drag force.
- (3) At the tail of the golfrisbee, the skirt 16 guides the airflow to wash downward to increase the lift and drifting distance as the slot flap does.

On the contrary, in the Innova patent, the design of triangle rim will cause the air flowing upward, instead downward. It reduces the airlift force of the flying disk.

FIG.8B shows golfball 15 which uses the same launching mechanism as golfrisbee 1 does.

The flying object is a golfball 15. The golfball 15 comprises a ball 151 and a stick 152.

The fitting screw 13 is mounted on an end of said stick 152. The other end of said stick 152 is inserted in the ball 151. FIG.[1B]8C is the right-hand golh club 2R; FIG.[1C]8D is the left-hand golh club 2L. The weight 23 is to train the golher to develop the golh muscle. The slot 231 is to have the weight 23 to be mounted on the golh club. The fixed handle is located at the end of the

golh club. The sliding handle 21 is to have the natural slow-to-fast swing movement. The slot 211 is to have the sliding handle to be mounted on the golh club.

FIG.[2]9 is the section view of the sky-ballet golfrisbee and the golh club. The sky-ballet golfrisbee is in the UFO shape with right-handed screw cap 13R and left-handed screw cap 13L. This is the basic model of the sky-ballet golfrisbee 1. Due to the co-existence of the screw caps 13R and 13L, the weight of sky-ballet golfrisbee 1 is well balanced. Due to the weight balance, it does not have the wobbling phenomena that the sky-ballet flying distance is much longer than the unbalanced flying disk. Furthermore, the screw caps 13R and 13L are embedded in the sky-ballet body itself. Since the screw cap 13R and 13L are located at the rim. To embed the screw cap 13R and 13L in the body of the sky-ballet golfrisbee, the rim of the sky-ballet golfrisbee has the ring band 1rb structure as shown in FIG.10H. It reduces the aerodynamic drag force that the sky-ballet golfrisbee can fly longer and further. The left-hand screw 34L is fit in the left-hand cap 13L; the right-hand-screw 34R is fit in the right-hand cap 13R. Except the left-hand screw 34L, the structure and operation of the left-hand golh club 2L are the same as the right-hand golh club 2R.

The right-handed screw 3R has the right-handed screw 34R notched on its top end. The bottom of the right-handed screw stub 3R is pivotally mounted in the club head 36. The screw 3R is locked with the locking screw 35. For one fixed cap 13R, the rotation of screw 3R determines the launching position on the swiveling circle of the swiveling golh club 2R as shown in FIG.6. To launch the golfrisbee with golh club properly, the allowance of angle of the screw 3R rotation is only 5 degrees.

FIG.9B is the exposed cross-section of the golfball. The golfball 15 has one handle 152 with the screw 1520 to screw in the ball 151. The ball 151 is similar to the conventional golf ball. A light means and/or sound means 12 being installed in the middle of said female screw 13R, and said male screw 3R being empty in the middle portion to adapt the light means and/or sound means 12.

The extension club locker 22 is optional. To adjust the length of golh club, the golh club has two segments. Releasing the extension club locker 22, the lower segment 2[L]B is slidable in the upper segment 2U. Locking the extension club locker 22, the lower segment 2[L]B is locked in the upper segment 2U. The length of golh club is adjusted to be the ideal club length of the golher.

The rotational motor 70 is optional. In the most popular used basic golh club 2, the rotational motor 70 doesn't need at all. The operation of the basic golh club completely relies on the swivel of club with hands. As use the rotational motor, the locking screw 35 is released to allow the screw 34R to have the free rotation. The rotation motor index 71 is the stopping position of the rotational motor 70. The battery 5 embedded in the handle is to supply the power to the rotation motor 70. The switch 51 is to turn on and turn off the rotation of the rotation motor 70. There is turn-on process and turn-off process. For the turn-on process, the battery power is first on, and then the rotation motor 7 starts to rotate. For the turn-off process, the motor rotator first stops the screw 34R at the position prescribed by the index 71. Then the battery power is shut down.

Swiveling the golh club 2 to launch the golfrisbee, the golfrisbee 1 rotates on the golh club 2 with the golh club head 34 being the pivotal center. It builds up the angular momentum. The rotational radius is large. As the golfrisbee takes off, the center of rotation is at the center of the

golfrisbee. The rotational radius becomes small. According to the conservation of angular momentum, the rotation speed of the golfrisbee will become faster. The effect is similar to the ballet dancer shrinking her hands in front of her chest to speed up the spin speed. Therefore, the golfrisbee is referred to be the sky-ballet golfrisbee. To increase the sky-ballet effect, the ring band mass is reduced and the center mass is increased with the addition of weight 12 as shown in FIG.9.

The golh sport is constituted of two core technologies - the universal wing and the swiveling club technologies. As shown in FIG.8A, the golfrisbee 1 is the merge of the technologies of disk, ring and boomerang. Since the golh is a brand new sport, so we introduce the innovation of golh product step and step as shown from FIG.10 to FIG.26. It is noted that FIG.9A is the view of the golfrisbee as shown in FIG.11B; FIG.8A is the view of the golfrisbee as shown in FIG.12B.

The design of the ultra long flying disk is much different from the conventional flying disk and frisbee. To keep the golfrisbee 1 horizontal statue to fly for the ultra long distance, the golfrisbee rotates and uses the gyroscopic force to stabilize the horizontal flight statue. Furthermore, for the ultra long distance flying disk of golfrisbee 1, the low drag force airfoil of the wing and the side stability are the most important issues. Without the side stability, the golfrisbee 1 will roll in the side direction then lose the lift force and falls to ground.

So far, there is no flying disk use the aerodynamic airfoil as shown in FIG.10A to design the flying disk. The golfrisbee is the first to apply the wing theory of the aerodynamics to design. As shown in FIG.10A, being relative to the wind direction 1w, as the conventional uni-directional flying wing with airfoil 1mf flies in the wind with the tip forward, the wing with airfoil 1mf is

flying in the forward direction. As shown in FIG.10b, being relative to the wind direction 1w, the conventional wing with airfoil 1mb can not fly in the backward direction. However, the golfrisbee is rotational during the flight to maintain its horizontal flying status. The golfrisbee must fly in both forward direction and backward direction. Actually, for the rotational golfrisbee, we need the universal directional flying capability. However, for simplicity, we use bi-directional flying wing to make the analysis and design for the universal flying

To fly in both forward direction and backward direction, as shown in FIG.10C, the forward flying wing with airfoil 1mf and the backward flying wing with airfoil 1mb are overlapped. The forward wing 1mf and the backward wing 1mb are adjusted to have the maximum overlap of the upper curvatures. Then the transition smooth curvatures are connected between the forward wing 1mf and the backward wing 1mb. The lobe 1rb is formed. As shown in FIG.11, for the golfrisbee disk, the lobe 1rb becomes the ring band. The envelop of the overlapped wing, as shown in FIG.10D, is the airfoil with main plane 1m of the bi-direction flying wing of the golfrisbee.

To increase the performance of the wing, the wing is further has additional wing segments. As shown in FIG.10E, the wing with airfoil 1f is constituted of main plane 1mf, slat 1f1, slat slot 1f2, flap 1f3, flap slot 1f4. Slat 1f1 is auxiliary airfoil fitted to the leading edge of the wing. At high angles of attack, the angle of attack of the slat 1f1 being less than that of the main plane 1mf, there is a smooth air flowing over the slat 1f1 which tends to smooth out the eddies forming over the wing 1f. Slat 1f1 is fitted to the leading edge near the wing tip to improve lateral control. Slot 1f2 is the passageway built into the wing 1f a short distance from the leading edge in such a way

that, at high angles of attack, the air flows through the slat slot 1f2 and over the wing 1f, tending to smooth out the turbulence due to eddies.

As shown in FIG.11 and FIG12, the slat 1f1 also serves as the wing fence at the position 16fn. In the conventional unidirectional flying wing, the wing fences is fin-like vertical surfaces attached to the upper surface of the wing, that are used to control the airflow. On swept wing airplane, the wing fence prevents the drifting of air toward the tip of the wing at high angles of attack. On straight wing airplane, the wing fence controls the airflow in the flap area. In both cases, the wing fence gives better slow speed handling and stall characteristics.

As shown in FIG.10E, the flap 1f3 is a high lift device which increases the camber of the wing 1f and also increases the effective wing area. The use of flap 1f3 gives better take-off performance and permits steeper approach angles and lower approach and landing speeds. Flap slot 1f3 makes the flap 1f3 to be slotted flap 1f3. The Slotted flaps 1f4 produce lift in excess of drag.

Since the golfrisbee is a rotating during flight, as the wing 1f rotates 180 degrees, the wing tail become wing tip as shown in FIG.10F. To make the golfrisbee to fly with wing tail as the wing tip does, we need to make the innovation of the wing. As shown in FIG.10G, the forward wing 1f and backward wing 1b are overlapped together. The cross section of the universal directional flying golfrisbee wing 1 as shown in FIG.10H is the envelope of the forward wing 1f and backward wing 1b as shown in FIG.10G. The skirt 16 is serves as both slat 1f1 and flap 1f3 as the conventional wing slat and flap do.

This bi-directional wing can be generated to be plural directional wing. A plural directional wing having a plural directional flying capability. As shown in FIG.10 is the bi-directional wing. The bi-direction wing can be extended to plural direction wing to have flying capability in a plural direction. For the rotational flying disk, we need to have the universal direction ring. As shown in FIG.11, it shows the golfrisbee disk having the universal directional flying capability to have the rotational flying capability. For each flying direction, the plural directional wing has a cross section to be the envelop of a forward direction of a uni-directional wing cross section 1f or 1mf and a backward direction of a uni-directional wing cross section 1b or 1mb as shown in FIG.10C and FIG.10G. There are transitional smooth curves between the forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section. For each flying direction of the plural direction wing has the cross section as shown in FIG.10D and FIG.10H.

For the rotationally flying disk, the disk needs to have the universal direction flying capability. The universal direction flying wing is in a disk shape. The disk shape wing has any section view crossing a center of said disk to be a cross section to be the envelop of a forward direction of a uni-directional wing cross section 1f and a backward direction of a uni-directional wing cross section 1b, There are transitional smooth curves between the forward direction of a uni-directional wing cross section 1f and the backward direction of a uni-directional wing cross section 1b. For the high performance uni-direction wing further comprises a slot slat 1f1 and a slot flap 1f3.

The envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section forming a disk 1m made of the main planes and the slot skirts made of s slot slat 1f1 and slot flap 1f3. As shown in FIG.11B and FIG.12B, being

relative to the wind direction  $1w$ , at the position  $16st$ , the skirt serves as the slotted slat  $1fl$ ; at the position of  $16fps$  the skirt serves as the slotted flap  $1f3$ .

Furthermore, the skirt  $16$  serves as the empennage of tail assembly of the conventional airplane does. The empennage gives stability to the aircraft. The skirt serves as the horizontal stabilizer and the vertical stabilizer or fin. As shown in FIG.11B and FIG.12B, at the position  $16em$ , the skirt  $16$  serves as the vertical stabilizer. At the position  $16fps$ , the skirt  $16$  serves as both flap  $1f3$  and the horizontal stabilizer. As the skirt  $16$  serves as the horizontal stabilizer, the skirt  $16$  is used to prevent the golfrisbee from pitching up or down. As the skirt  $16$  serves as the vertical stabilizer, the skirt  $16$  is used to prevent the golfrisbee from yawing in side direction. It serves to offset the tendency of the golfrisbee to roll in the side direction. As shown in FIG.11C, the principle behind the skirt operation is the compensation of the difference of lift force with the difference of the downwash air flow. As the wind  $1w$  blows on the golfrisbee  $1$ , due to the rotation of the golfrisbee  $1$ , one side flow  $1rl$  has the higher relative wind speed than the other side  $1rr$ . According to the Bernoulli Law, the difference of relative wind speed over the main plane  $1m$  generates the different air pressures that the lift forces  $1pl$  and  $1pr$  on two sides are different. Due to the viscosity of boundary flow over the main plane  $1m$ , the absolute air flow speeds  $16al$  and  $16ar$  on two sides are different. The air flows hit on the skirt  $16$  and flow downward with different speeds. The different speeds air flow generates the different forces  $16sl$  and  $16sr$ . The momentum caused by the difference of the lift forces  $1pl$  and  $1pr$  will be compensated with the momentum caused by the difference of the forces  $16sl$  and  $16sr$ . So the golfrisbee  $1$  can be kept to fly horizontal position for the ultra long distance fly.



As shown in FIG.12, the wing is in a ring shape wing. The ring shape wing has the section view crossing a center of the ring to be the envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section. There are transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section.

As shown in FIG.12, the universal direction wing developed from the disk in FIG.10H can be applied to the wing of the flying ring. The cross section of the golfrisbee ring is in the shape of the golfrisbee disk as shown in FIG.10H and FIG.11A. FIG.12B is the isometric view of the FIG.8A. As shown in FIG.12B, for the front portion 16st of the ring, the outer skirt serves as the slat; the inner skirt 16fps serves as flat. For the rear portion of the ring, the inner skirt serves as the slat 16st; the outer skirt serves as the flat 16fps. At the right side and left side, both the outer skirt and inner skirt serve as the empennage 16em.

FIG.13 shows the combination or hybrid of the golfrisbee disk and golfrisbee ring structure. The golfrisbee disk 1h has a central hole. The skirt 16 is also installed along the rim of the central hole. It is wrong idea to differentiate the flying disk from flying ring. Actually, there is no distinguish between the golfrisbee disk and the golfrisbee ring. To keep the flying stability of the flying disk, there is one golden rule: the radius of the disk cannot be more than 20 times of the skirt height. If the radius of the flying disk is larger than 20 times of the vertical height of the skirt, then the hole must be introduced to the center of the flying disk to keep the ratio of the span of the main plane to the skirt height being less than 20. If there is a hole in the disk, then it referred to be ring. However, the flying structure of ring is still the same as the disk.

The second core technology of the golfrisbee is the swiveling club throwing technology. The swiveling club throwing technology not only throws the golfrisbee 1 but also throws the golfball 15, boomerang, etc. FIG.14 shows the golh set made of the golfball 15 and golh club 2. The fit mechanism between the flying object and the head of golh club is screw. To reduce the air drag force, the fit screw of the flying object is female screw 13 and the head of golh club 2 is male screw 3. The light and sound generator 12 is embedded in the female screw 13. There is one pore 34p in the screw head 3 to adapt the light and sound generator 12 as the golfball 15 is mounted on the screw head 3. The golfball 15 is thrown with the golh club 2 as shown in FIG.1A. The fast release latch 1521 is biased by a spring hidden in the bar 152. The fast latch 1521 fits in the notch 1511 in the ball 151 to lock the bar 152 with the ball 151. Twist the bar 152, the fast release latch 1511 will be suppressed and the bar 152 can be pulled out of the ball 151. Then the ball 151 can be put to roll into the hole 6 as shown in FIG.7A. As shown in FIG.14C, there is one arrowhead 151a attached to the golfball 15. The fin 153 is to control the throwing direction of the golfball 15. As shown in FIG.1C, the golfball 15 is thrown to fly and shoot at the target board 18a.

FIG.15 shows the swiveling golh club and the universal direction wing technology applying to boomerang 171. The flying object is a boomerang 171. The boomerang 171 comprises two branches jointing together at a central joint. The fitting screw 13 is mounted at the central joint. Fig.15A and FIG.15C is the application of the swiveling golh club technologies to the boomerangs 171m and 171. As shown in FIG.15A, the boomerang 171m is made of two branches and each branch has the cross section as shown in FIG.10D. As shown in FIG.15C, the boomerang 171 is made of two branches and each branch has the cross section as shown in FIG.10H. As shown in

FIG.15E, the golh club 2 is swiveled backward to be ready to throw the golfrisbee boomerang 171. As shown in FIG.15F, due to the eccentric force, the golfrisbee boomerang 171 rotates. As shown in FIG.15G, the golfrisbee boomerang 171 takes off and flies in the sky.

FIG.16 shows the swiveling golh club and the universal direction wing technology applying to multi-boomerang 172. The flying object is a multi-branches boomerang 172, the boomerang 172 comprises multiple branches jointing together at a central joint. For the odd number of branches, the boomerang will turn and fly back. For the even number of branches, the boomerang will not turn. Adjust the number of the branches, we can control the curvature of fly path. To have the eccentric force, the fitting screw 13 is mounted at ends of branches. Fig.16A and FIG.16C is the application of the swiveling golh club technologies to the tri-boomerang 172m and 172. As shown in FIG.16A, the tri-boomerang 172m is made of three branches and each branch has the cross section as shown in FIG.10D. As shown in FIG.16C, the tri-boomerang 172 is made of three branches and each branch has the cross section as shown in FIG.10H. As shown in FIG.16E, the golh club 2 is swiveled back to be ready to throw the golfrisbee tri-boomerang 172. As shown in FIG.16F, due to the eccentric force, the golfrisbee tri-boomerang 172 rotates. As shown in FIG.15G, the golfrisbee tri-boomerang 172 takes off and flies in the sky.

FIG.17 shows the swiveling golh club and the universal direction wing technology applying to polygon boomerang 173. The flying object is a polygon boomerang 173, The polygon boomerang 173 comprises branches jointing together to form a polygon. The fitting screw 13 is mounted at joints of the branches. For the odd number of edges, the polygon boomerang will turn and fly back. For the even number of edges, the polygon boomerang will not turn. Adjust the

number of the edges, we can control the curvature of fly path. Fig.17A and FIG.17C is the application of the swiveling golh club technologies to the triangle boomerang 173m and 173. As shown in FIG.17A, the boomerang 173m is made of three edges and each edge has the cross section as shown in FIG.10D. As shown in FIG.17C, the triangle boomerang 173 is made of three edges and each edge has the cross section as shown in FIG.10H. As shown in FIG.17E, the golh club 2 is swiveled back to be ready to throw the golfrisbee triangle boomerang 173. As shown in FIG.17F, due to the eccentric force, the golfrisbee triangle boomerang 173 rotates. As shown in FIG.17G, the golfrisbee triangle boomerang 173 takes off and flies in the sky.

FIG.18 shows the swiveling golh club and the universal direction wing technology applying to golfrisbee disk 1d. The flying object is a disk 1d. Fig.18A and FIG.18C is the application of the swiveling golh club technologies to the golfrisbees 1dm and 1d made of flying disk. As shown in FIG.18A, the golfrisbee 1dm has the cross section as shown in FIG.10D. As shown in FIG.18C, the golfrisbee 1d has the cross section as shown in FIG.10H. A light and sound generator 12 is installed in the middle of female screw 13. The male screw 34 of club head is empty in the middle portion. The light and sound generator 12 is embedded in the cavity of female screw 13 not only to reduce air drag to increase throwing distance of flying disk but also having weight balance for the flying disk. As shown in FIG.18E, the golh club 2 is swiveled backward to be ready to throw the golfrisbee disk 1d. As shown in FIG.18F, due to the eccentric force, the golfrisbee disk 1d rotates. As shown in FIG.18G, the golfrisbee disk 1d takes off and flies in the sky.

FIG.19 shows the swiveling golh club and the universal direction wing technology applying to the golfrisbee ringdisk 1r. The flying object is a ringdisk 1r. Fig.19A and FIG.19C is the

application of the swiveling golh club technologies to the golfrisbee ringdisks 1rm and 1r. As shown in FIG.19A, the golfrisbee ringdisk 1rm has the cross section as shown in FIG.10D. As shown in FIG.19C, the golfrisbee 1r made of the ring has the cross section as shown in FIG.10H. As shown in FIG.19E, the golh club 2 is swiveled backward to be ready to throw the golfrisbee ring 1r. As shown in FIG.19F, due to the eccentric force, the golfrisbee ringdisk 1r rotates. As shown in FIG.19G, the golfrisbee ringdisk 1r takes off and flies in the sky.

FIG.20 shows the swiveling golh club and the universal direction wing technology applying to golfrisbee 1h made of the hybrid of the disk and ring. The flying object is a diskring 1h. Fig.20A and FIG.20C is the application of the swiveling golh club technologies to the golfrisbee diskings 1hm and 1h. As shown in FIG.20A, the golfrisbee diskring 1hm has the cross section as shown in FIG.10D. As shown in FIG.20C, the golfrisbee diskring 1hm has the cross section as shown in FIG.10H. As shown in FIG.20E, the golh club 2 is swiveled back to be ready to throw the golfrisbee diskring 1h. As shown in FIG.20F, due to the eccentric force, the golfrisbee diskring 1h rotates. As shown in FIG.20G, the golfrisbee diskring 1h takes off and flies in the sky.

FIG.21 shows the swiveling golh club and the universal direction wing technology applying to boomerang diskring or boomerang ringdisk. As shown in FIG.22, the same golfrisbee 1 has the structure to be diskring 1dr as shown in FIG.22B or the structure to be ringdisk 1rd as shown in FIG.22C. Both of them are referred to be the sky ballet golfrisbee 1. The skyballet golfrisbee has the hybrid structure of the disk, ring and boomerang. Fig.21A and FIG.21D are the application of the swiveling golh club technologies to the sky ballet golfrisbee

1 made of the boomerang diskring 1dr or boomerang ringdisk 1rd. As shown in FIG.21A, the golfrisbee 1m is the main plane of the structure either to be the main plane of diskring 1dr as shown in FIG.22B or the structure of main plane to be the main plane of ringdisk 1rd as shown in FIG.22C.

As shown in FIG.22B, the flying object is a boomerang type diskring 1dr. The boomerang 17 is at the center portion of the diskring 1dr. The boomerang 17 is constituted of a plural of branches. As shown in FIG.22C, the flying object is a boomerang ringdisk 1rd and the boomerang is at the center portion of said diskring 1dr. The boomerang 17 is constituted of a plural of branches. As shown in FIG.21C, the golfrisbee 1 has the cross section is either to be diskring 1dr as shown in FIG.22B or the cross section of ringdisk 1rd as shown in FIG.22C. As shown in FIG.22G, the golh club 2 is swiveled backward to be ready to throw the sky ballet golfrisbee 1. As shown in FIG.21H, due to the eccentric force, the sky ballet golfrisbee 1 rotates. As shown in FIG.21J, the sky ballet golfrisbee 1 takes off and flies in the sky. As shown in FIG.21G, there are arrowheads 1a around the peripheral of the golfrisbee 1m. As shown in FIG.1C, swiveling the golh club, the golfrisbee with arrowhead hits and attached on the target board 18a.

FIG.23 shows the alternative design of the sky-ballet golfrisbee 1 made of the boomerang diskring. As shown in FIG.23D, the boomerang polygon is the combination of two different boomerang 172m and 173m as shown in FIG.16 and FIG.17. Comparing with the boomerang polygon as shown in FIG.23E with the boomerang diskring as shown in FIG.23A, the boomerang ring disk is the boomerang polygon with the number of edges to be infinite. The sky-ballet

golfrisbee 1 is also considered to be the combination of the boomerang 172m as shown in FIG16 and the diskring 1h as shown in FIG.20. As shown in FIG.23, the hole 42 in the ring band is to reduce the weight. The center weight 12 is added to the center of the sky-ballet golfrisbee to increase the sky-ballet effect. The center weight 12 is constituted of the weights 120, 124 the screw 122 and the nut 123. For the night golf and/or snow golf, the weight 120 and/or 124 can be either the light source and/or the sound source. For the ultra long distance, the addition of the weight is not easy. If the weight is larger than the aerodynamic lift force, the flying disk will dive downward and the flying distance is decreased instead of increase. So the light or sound needs to design very compact to reduce the weight and size. As shown in FIG.[1]36, the weight 120 is the light source for the night golf. The screw 122 passes the hole 1203 to hold the light 120 to the sky-ballet golfrisbee 1. The light source 1200 emits the light in the night golh to guide the golher to locate the sky-ballet golfrisbee. To save the power, the light sources are LED. The LEDs have different colors. As the golfrisbee rotates in the night, it has the rainbow in the dark sky. The switching button 1201 can be pushed to shut the battery power. The switching button can be capacitor type that the seal of 1201 can be solid. The battery and the switching circuit 1202 are to supply the power and light control to the light source 1200.

As shown in FIG.[1]37, it shows the sound source 124 is to add the weight at the center of the sky-ballet golfrisbee. The screw 122 passes the hole 1243 to hold the sound source 124 to the sky-ballet golfrisbee 1. The speaker 1240 generates the sound to guide the golher to locate the sky-ballet golfrisbee. The switching button 1241 can be pushed to shut the battery power. The switching button can be capacitor type that the seal of 1241 can be solid. The battery and the switching circuit 1242 are to supply the power and light control to the light source 1240.

As shown in FIG.28, to have the video, audio effect, enhanced sky-ballet effect and the curved flying capability, the sky-ballet golfrisbee is modified to be the helicopter type sky-ballet golfrisbee. The wing 17 has many different wing segments to modify the curved flying path of the sky-ballet golfrisbee. As shown in FIG.28A, the wing 17 having the segment 17a is for the right-hand golh club to have the curved up flying path. As shown in FIG.28B, the wing 17 having the segment 17b is for the left-hand golh club to have the curved up flying path. As shown in FIG.28C, the wing 17 having the segment 17c is for the left-hand golh club or right-hand club to have the curved up flying path. The segment 17c is derived from the bidirectional wing segment 1m as shown in FIG.10D. As shown in FIG.28D, the wing 17 having the segment 17d is for the right-hand golh club to have the curved down flying path. As shown in FIG.28E, the wing 17 having the segment 17e is for the left-hand golh club to have the curved down flying path. As shown in FIG.28F, the wing 17 having the segment 17f is for the left-hand golh club or right-hand club to have the curved down flying path.

As shown in FIG.24, the golfrisbee has the universal wing 17a. The wing segment 17a can adjust the angle of attack to change the flying path of the golfrisbee. The wing segment 17a has the short stub 17b pivotally fit in the golfrisbee body. Changing the angle of the attack of the wing segment 17a, the lift force of the golfrisbee will change. The flying path of the golfrisbee will change accordingly.

There are many different versions of the sky-ballet golfrisbee. As shown in FIG.24, the cap 131L is the punched through cap. For the punched through type cap, the launching angle can be



increased a lot. Furthermore, the sky-ballet golfrisbee 1 can be made much thinner. It can reduce the drag force. The flying distance can be much farther. As shown in FIG.25 the wing segment 17 is optional to be removed to be a sky-ballet golfwing. As shown in FIG.26, the sky-ballet golfrisbee has only one right hand cap to minimize the air drag. To have the weight balance, the air bubble 13b is embedded in the golfrisbee body on the opposite site of the cap. The volume of the air bubble is the same as the volume of the cap.

[ The screw mechanism of golfrisbee is a complicate mechanism. It] The screw needs the lubricant to reduce the static friction. The initial static friction causes the uncertainty during the golh club swiveling process. To have the consistent swiveling process and expected result, the lubrication is needed to eliminate the stick force of the initial static friction. Furthermore, as the golfrisbee falls on the ground, the dirt sticks to the screw of the cap. It will cause the inconsistent swiveling result. So, the cap 13 of the sky-ballet golfrisbee is needed to be checked and cleaned quite often.

As shown in FIG.27, in the field operation, we use the static friction controller 7. It has the three processes to be integrated in one device: the air compression, the air clean and the lubricant application. The static friction controller is constituted of the compressing cylinder 70, the switching block 71, the spraying nozzle 72 and the container 74. The lubricant 75 is stored in container 74. The cap 742 is to seal the lubricant 741 entrances. The spraying nozzle 72 is mounted on the top of the sliding cylinder 70. The sliding tube 70 can be fit in the hole 722. The cavity 723 guides the fluid into the nozzle 720. The hole 721 is to fit for the spraying tube. As the finger presses on the spraying nozzle 72, the sliding cylinder 70 slides downward as shown in the

FIG.27B. The one-way compression piston 7021 moves upward to seal the conduit. The one-way compression valves 714 moves downward to allow the air to be sucked into the conduit 713. The air inside the switching block compartment 716 is forced to flow out into the container 74. As the finger is released, the sliding cylinder 70 moves upward under the air pressure in the compartment 716. The air inside the conduit 713 is compressed and the one-way valve 714 is closed. As the air pressure inside the conduit 713 is larger than the air pressure in the compartment 716, the one-way valve 7021 moves downward and the compressed air flows into the compartment. Repeating the process as shown in FIG.27A and FIG.27B reciprocally, the air pressure inside the container 74 is built up.

To use the compressed air to clean the cap of the golfrisbee or the screw of the golh head, as shown in FIG.27C, the finger holds the sliding tube at the position to have the conduit 701 to align with the hole 711 on the wall of the switching block 71. The compressed air flows through the hole 711, the conduit 701, the cavity 723, and the nozzle 720. The compressed air blows on the cap or screw to blow away the dirt. As the dirt is cleaned, the golher can apply the lubricant 75 to the cap or screw. As shown in FIG.27D, the finger holds the sliding tube 70 at the position to have the conduit 701 to align with the hole 712 on the wall of the switching block 71. The lubricant 75 flows throw the hole 712, the conduit 701, and the cavity 723 and the nozzle 720. The lubricant 75 sprays on the cap and screw to lubricate the cap and screw..

Depending on the distance between the threads of the screw, there are many different golh club heads. Therefore, the golher may carry several golh clubs. However, to carry the golh bag walking on the snow is not so easy. So, the trolley is needed. As shown in FIG.29A, the golh trolley 5 is

mounted on the axle 500 of wheels 50. The foldable handle 51 pulls the frame 52 to drag the golh trolley 5 forward. The supporter 55 is hinged to the ear 520 on the frame 52 with the pivotal axle 550. The golh bag 4 is leaned against the frame 52. FIG.29B shows the golh bag being integrated with the portable trolley 5a. To ski on the snow, as shown in FIG.29C, the trolley 5 is mounted on the snow ski 901. To ski on the snow and run on the road, as shown in FIG.29D, the trolley is mounted on the belt wheel 501. The belt wheel is composed of two wheels 5011 and 5012, belt 5013 and triangle structure 5014. The trolley 5 is pivotally mounted on the top node of the structure 5014.

To play the night golh in the desert or the snow golh in the heavy snow northern place, the golher has to ride on the cart. In the desert, during the day, the temperature is too high to play golh. The only time to play golh is in the night. However, in the night, the snakes come out, too. To minimize the accident, the golher has to ride on the golh cart. In the heavy snow place, the snow depth can be very deep. It is impossible for the golher to ski to drag the golf trolley. The golher has to ride on the golh cart, too.

There are two kinds of cart. One is three-wheel golh cart 8 as shown in FIG.130. The golher can stand on the golh cart 8 to drive the golh cart. The golh cart is a foldable and portable golh cart. Releasing the extension lock 821, the length of pole 82 can be adjusted. The pole 82 is foldable with the pivotal joint 830. The technique for the golh cart adopts our former patent US5, 474,144 Twin-Wheel Motor Car with Differential Height and Speed Mechanism. It needs only one motor to drive the twin- wheels 80. Since it is the three wheels, it does not need the complicate self-balance circuits and control. It does not have the speed limit as the two wheel golh cart does.

So, the cost becomes much cheaper and the speed is much faster. As shown in FIG.[1]30C, the front wheel 86 is mounted on the support frame 82 with the axle 860. Rotating the handle 81, the frame 82 rotates which also causes the front wheel 86 to rotate to change direction. The twin-wheels have the differential mechanism to drive the wheels 86 to have the different speed during the turning direction. In FIG.[1]30B, the support 85 pivotally rotates on the axle 850 to support the ear 820. The support 85 supports the frame 82. The golf cart is served as the standing bag and golh trolley.

To run on the deep snow in the golf course, the wheel can change to be the snow wheel 80s as shown in FIG.[1]35. The wheel paddle 801 is at the end of the cylinder 802. The cylinder 802 is under the bias of the spring 803. As shown in FIG.[1]35A, the snow wheel 80s rolls on the solid ground. The wheel paddle 801 is compressed to be the same circle as the wheel 80s. As shown in FIG.[1]35A, the snow wheel 80s rolls on the snow. The wheel paddle 801 is expanded into the snow to serve as the paddle. The wheel paddle 801 expels the snow to drive the golh cart 8 forward or backward.

As shown in FIG.[1]30D to FIG.[1]30F, the golh cart 9 is further equipped with the automatic golh snow ski 9. As shown in FIG.[1]32A and FIG.[1]32B, the automatic golh snow ski 9 is raised up to run on the solid ground. As shown in FIG.[1]32C and FIG.[1]32D, the automatic golh ski 9 is lowered to support the weight of golh cart 9 to drive on the soft snow. The wheel can be changed to be the snow wheel 80s.

As shown in FIG.[1]32B, there is a Z-shape guiding slot 910 notched on the guiding plate 91. The wheel axle 600 passes through the Z-shape guiding slot 910. The spring 92 connects between the axle 600 and the ski 9 to pull the ski forward to raise the ski 9. The spring 92 is constituted of two segments 923 and 924. The segment 924 has the hooked end 921 to hook the axle 600. The segment 924 has the hooked end 920 to hook the ear 923 of the guiding board 91. Under the compression force of the spring 92, the guiding plate 91 is pulled forward to raise the ski 9 up.

As shown in FIG.[1]32C, the wheel rolls on the soft snow 95 and traps in the snow 95. The snow 95 contacts with the ski 9. As the wheel 60 rotates to drive the golh cart to move forward, due to friction, the ski 9 is left behind. The wheel axle 600 climbs up the slope of the Z-shape guiding slot 910 forces the ski 9 downward to engage with snow 95 to support the weight of golh carts.

FIG.[1]33 shows the installation of the snow ski without removing the wheel. As shown in FIG.[1]33A, the wheel axle 600 passes the slot and presses the locking plate 912 downward. The locking plate 912 is pivotally mounted on the guiding plate 91 with the pin 9120. FIG.[1]33B shows the axle 600 is mounted in the guiding slot 910. FIG.[1]33C shows the locking a plate is closed with the biasing spring. FIG.[1]33D shows the hook 921 is attached to the axle 600 and the installation is finished. FIG.[1]34 shows the lower slot of Z-shape guiding slot can make the extension to be the guiding slot 910e. The snow ski 9 can be folded to integrate with the golh cart or golh trolley.

FIG.[1]31 shows the two-wheel golh cart. The golh cart is foldable and portable. Releasing the extension lock 621, the length of pole 62 can be adjusted. The pole 62 is foldable with the pivotal joint 630. The golh cart can be further innovated from the Segway of Dean L. Kamen et al's patents US5, 971,091 Transportation Vehicles and Methods and US6,302,230B1 Personal Mobility Vehicles and Methods. The supporting stick 65 is pivotally mounted on the frame 62 with the pivotal axle 650 passing the ear 620 of the frame 62. The two-wheel golher cart 6 is served as the standing bag as shown in FIG.[1]31B. The snow ski 9 can be mounted as shown in FIG.[1]32D, FIG.[1]32E and FIG.[1]32F. The wheel can be changed to be the snow wheel 8s, too.

FIG.[1]38 show the self-locked portable golh bag for traveling golher. As shown in FIG.[1]38A, the golf bag has the self-lock cap 43 being self locked with the golf bag 42. The handle 41 is to carry the golh bag 42 or to hang the golh bag 42 on the golh cart as shown in FIG.[1]30. Under the biasing spring 431, the pressing plate 432 presses against the top rim of the golh bag 42. Under this pressure, the protrude 430 is locked in the notch 4210. To open the golh bag, press cap 43 downward, the protrude 430 moves downward to slide in the slot 421. Rotating the cap 43, the protrude 430 slides to the end of the horizontal segment of the slot 421. Lifting up the cap 43, the golh bag 42 is opened. As shown FIG.[1]38B, the cap 43 can be held at the bottom of golh bag 42 to facilitate the carry of the golh bag 42. Sliding the protrude 430 into the vertical segment of the slot 422 and press the cap 43 upward. As the protrude hits the end of the vertical segment, rotating the cap 43 horizontally to the end. Releasing the pressure on the cap 43, under the biasing force of the spring 431, the pressing plate biases against the bottom plate of the golh bag 42. Under the biasing force, the protrude 430 is fit in the notch 422. The self-locked cap 43 is self-locked to the bottom of the golh bag 42.

To play the basedisc, we need the portable base. To play the golh in the park, we need the portable-putting hole. As shown in the FIG.[1]39, it shows the universal portable hole base. It can be used as either the base in the basedisc or the putting hole in the park golh. The rolling golfball can roll upward on the inclined plane 452 and the plateau 451 into the hole 450. The flag 46 has the flag 461 to mark the number of the hole. The flag is inserted in the hole 450 of the base 45 with the stub 460 fitting inside the hole 450.

The swing of golh is different from the swing of golf. To launch the golfrisbee with the golh club, the swing speed and the swing pattern is very important. To train the golher to be familiar with the swing way of golh, as shown in FIG.[2]40, the golh swing trainer 10 is important for the golh instructor. The golher stands inside the golher trainer and has the golher club 2 fit inside the swing glider 23s as the same position as the payload 23 shown in FIG.[1]8. The handle 21s is fit at the position 21 shown in FIG.[1]8. The Computer aided golh instructor 101 drives the solenoid tube 1022 located inside the tube 102 to rotate to drive the gliding stub 1021 and the swing glider 23s to slide. The swing glider 23s is to guide the correct swing speed of the golh club. In FIG.[2]40D, it shows the alternative design of the guide. As the pulley 101p pulls the rope 1025, the guide 23s slides to move to guide the correct swing speed.

The golh simulator is the miniature of the portable wheel balance machine. Instead of balancing the wheel, we apply the same principle and mechanism to measure the rotation of the golfrisbee 1. The golher can easily check the simulating results of flying distance, launching angle, launching speed, and flying direction on the LCD screen. Furthermore, the golher can adjust the

parameter of the viscosity of the lubricant, the starting angle, the launching angle of the screw, etc to find the optimum swing pattern for himself. With the golher simulator, the golher does not need to go through the tedious “launching and walking, trial and error” process and improve his techniques systematically.

FIG.[2]41 is the golh simulator 11. The golfrisbee 1 is mounted on the rubber wheel head 111. The rubber 1111 envelops around the steel drum 1110 to be the rubber head. Any golfrisbee cap 3 can easily fit on the rubber wheel head 111. As the golher swings the golher club, the sensors 113 and microprocessor 114 of balance mechanism record and analyze the dynamical behaviors of the golfrisbee. The dynamics results are shown on the LCD display. The LCD display 112 is mounted on pole of the golf club.

The golfrisbee is made of the composite material to be one single piece. Furthermore, the golfrisbee has the screw. Therefore, the mass production manufacture process is very important to the golh industry. As shown in FIG.[2]42A, the manufacture of making golh club and golfrisbee module is highly complicated four step process. In the first step, the golh club head locking screw 35, launching stubs 34 R and 34L are cast with model. As shown in step 2, the locking screw 35 is put in the club head module to cast the golh head with the locking screw 35. As shown in step 3, the launching stubs 34 R and 34L are put in the golfrisbee module to cast the golfrisbee with the launching screws. As shown in step 4, the golfrisbee is put in the skirt module to have the skirt 16 cast to be one unit with the golfrisbee 1.



FIG.[2]42B shows the assembly process of the golh club and golfrisbee. In Step 5, the handle, golf club head, golf club pole and golf launching stub are assembled to be the golh club. In Step 6, the payload 124, screw 123 and golfrisbee body are assembled to be golfrisbee 1. In step 7, the golfrisbee 1 is mounted on the launching screw stub and is ready for launching test. The detailed production process and flow are discussed in details as follows.

As shown in FIG.9, the golfrisbee is made of two materials. The skirt 16 material is made of the soft material 16s as shown in FIG46. The main plane 1m material is made of the elastic material 1me as shown in FIG.43. It adopted the double injection plastic modules as shown in FIG.43 and FIG.46. As shown in FIG.44, the golfrisbee is made of three materials. It adopted the triple injection plastic modules as shown in FIG.43 and FIG.46. To minimize the air drag, as shown in FIG.43, the callouts show the details of the curvatures for the stubs which support the skirt 16.

During the plastic module injection, to generate the screw 13 of the golfrisbee, it must rotate to retrieve the screwed module head 13s. The rotation of the screwed module head 13s will cause the distortion of the main plane 1m of the golfrisbee 1. To get rid of the distortion due to the rotation of the screwed module head 13s, there is the need for the special module injection process. A plastic injection module for the flying object comprises a screw module 13s and a main plane cavity module 190, said screw module 13s rotates to retrieve from said main plane cavity module 190 before said plastic injection modules 190 and 191 are open. As shown in FIG.43A, as the modules 190 and 191 close, the elastic plastics 1me is injected into the cavity of the main plane 1m. After the plastic injection, the screwed module head 13s rotates and retrieves

from the cavity as shown in FIG.43B. The modules 190 and 191 still close and press on the injected plastic main plain 1m to release the stress on the main plane 1m with the residue heat of the plastic injection and keep the main plane 1m in the original shape. After the main plane 1m is harden, then the module 191 opens as shown by the arrow 191t.

To increase the life of the golfrisbee 1, as shown in FIG.44, the screw bore 13 is made of the hard plastic material. The screw 134 is in the shape of dual half ring. The golfrisbee is constituted of three kinds of material: the soft skirt 16, the elastic main plane 1m and the hard screw 13. The composite golfrisbee 1 adopts the triple plastic injection process. To reduce the air drag, as shown in FIG.44C, the skirt support 161 envelops the edge of the main plane 1m. There are smooth transition curves between the skirt 16 and the main plane 1m. As shown in FIG.45A, the pore 13p reserves a hole 1mp as the elastic material 1me is injected for the main plane 1m. As shown in FIG.45B, the modules are separated and the hole 1mp is formed in the main plane 1m. Then the hard plastic 1mh is injected and the screwed module head 13s is inserted in the reserved pore as shown in FIG.45C. As shown in FIG.45D, the screw module head rotates and retrieves then the modules 190 and 191 open, the hard female screw 13 is formed.

As shown in FIG.46A, the soft plastic 16s is injected for the skirt 16. As the module 190 and 191 open, the complete golfrisbee 1 is done. It notes that the soft plastic 16s injection can be integrated with either FIG43 or FIG.44 to have the double injection or triple injection to minimize the production cost.

As the golfrisbee is large and flat for the long throwing distance, the distortion of plastic injection becomes problem. To overcome the shrinkage distortion in plastic injection, as shown in FIG.47, the backbone plate 1mk is embedded in the golfrisbee disk or golfrisbee ring. The screw

13 is integrated with the backbone plate 1mk. As shown in FIG.48, the backbone plate 1mk and screw 13 are injected with the hard plastic material 1mh. Then the backbone plate 1mk with the screw 13 is put in the cavity to be injected and enwrapped with the elastic plastic material injection 1me. The high technology and high performance golf frisbee is made of the composite material with the complex manufacturing process.

While the invention has been particularly shown and described with reference to the preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention.

We claim:

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1. A golh system comprises a golfrisbee means,  
said golfrisbee means being in circular symmetrical structure;  
said golfrisbee comprising a ring band at rim of said golfrisbee;  
a bottom of said ring band being lower than an outside circular edge of said golfrisbee;  
said ring band being thicker than other portion of said golfrisbee;  
said ring band having smooth transitional curve to outside edge and inside region.
2. A golh system according to claim 1 of which said ring band having cavity means,  
said golh system further comprising a golh club means,  
said golh club means comprising a head means,  
said cavity means of said ring band fitting on said head means of golh club means.
3. A golh system according to claim 1 of which said golfrisbee further comprising a skirt means,  
said skirt means attaching to said circular symmetrical structure with small stub means;  
between said skirt means and said circular symmetrical structure being space to allow air to flow through.
4. A golfrisbee means according to claim 3 of which said skirt means being made of soft material.
5. A golh system according to claim 1 of which a middle portion of said golfrisbee being a hole.

6. A golh system according to claim 1 of which a middle portion of said golfrisbee being segments of airfoils.

7. A golfrisbee means according to claim 1 of which a center of said golfrisbee further comprises accessories to increase weight of said golfrisbee to have sky-ballet spinning launching effect.

8. A golh system according to claim 7 of which said accessories further comprising lighting means, said lighting means is to shine light in the night golh sport.

9. A golh system according to claim 7 of which said accessories further comprising sound means, said sound means generate sound in the snow golh sport to guide golher to find said golfrisbee.

10. A golh system comprises a golfrisbee means,  
said golfrisbee means being in circular symmetrical structure;  
said golfrisbee comprising a circular skirt means being attached to said circular symmetrical structure with small stub means;  
between said skirt means and said circular symmetrical structure being space to allow air to flow through.

11. A golh system according to claim 1 further comprising a portable base, said base comprising a inclined plane and a hole, a golfball rolling on said inclined plane into said hole.

12. A golh system according to claim 2 of which

said golh club means further comprising a handle means, a pole means and a launching head means, said handle means being mounted on one end of said pole means and said launching head means being mounted on another end of said pole means,

said cavity means of said golfrisbee being fit on said launching head means of said golh club means.

13. A golh system according to claim 12, said golh club means further comprising a sliding handle means mounted on a upper portion of said pole means and a weight means mounted on a low portion of said pole for training purpose.

14. A golh system according to claim 12, said cavity of said golfrisbee further comprises screw means and said launching head means of said golh club means further comprise screw means.

15. A golh system according to claim 12 further comprises a golfrisbee cleaner means,

said golfrisbee cleaner means comprising a sliding tube means, a switching block means and single-directional valve means;

said switching block means having an air hole connecting to air inside a container of said golfrisbee means and a lubricant hole connecting to lubricant inside a container of said golfrisbee means;

as said sliding tubing means being compressed reciprocally, said single-directional valves means compressing air to flow into said golfrisbee cleaner means;

as an inlet of said sliding tube means in alignment with said air hole, compressed air blowing out through said sliding tube;

as an inlet of said sliding tube means in alignment with said lubricant hole, compressed lubricant blowing out through said sliding tube.

16. A golh system means according to claim 1 further comprising a self-locked golh bag means,

said self-locked golh bag means comprising a cap and a bag,

said bag comprising an L-shaped guiding slot at the top end and an L-shaped guiding slot at the bottom end;

said cap comprising a spring biased means and a protrudes means,

said protrudes means sliding in said L-shaped slot and said spring biased means biasing against said bag to have self-locked action.

17. A golh system means according to claim 2 further comprising a golh cart means, said golh cart means comprising a pair of wheel means, a frame means and a frame support means,

a bag means being able to hang on said frame means,

pulling out said frame support means, said frame means leaning on said frame support means and sitting on said pair of wheel means;

said golh cart means further comprising accessories of snow ski means and snow wheel means;

said golh cart means either pulled or self-driving with motor power means, golher standing on said golh cart means to drive said golh cart means.

18. A golh system means according to claim 12 further comprising a golh simulator means, said golh simulator means comprising sensors means, microprocessor means and display means, said sensors means sensing stress and dynamics behavior of said launching head means, said microprocessor means analyzing data collected by said sensor means; said display means displaying said data analyzed by said microprocessor means.

19. A golh system means according to claim 12 further comprising a golh swing trainer means, said golh swing trainer means comprising slanted circular means and elastic means, said elastic means hanging at left end and right end of said slanted circular means, said elastic means holding said pole of said golh club means, said slanted circular means further comprising a guiding means, microprocessor means and a driving means, said guiding means holding said lower portion of said golh club means to guide golher to swing according to preset swing pattern stored in said microprocessor means, said microprocessor means driving said driving means to shift said guiding means according to said preset swing pattern.

20. A golh system means according to claim 1 further comprising a golh manufacture process, said manufacture process being divided to be several steps, said manufacturing process comprising putting previous step module casting output means in a next module step to cast one new module of said next step.]



21. A plural directional wing means having a plural directional flying capability,

in each direction of said plural directional, there being bi-directional airfoil means having bi-directional flying capability,

said bi-directional airfoil means has a cross section being an envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section, there being transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section;

said uni-directional wing cross section being an airfoil of conventional airplane having a blunt tip portion and a narrow tail portion;

said bi-directional airfoil means having a maximum curvature fitting for an upper curve of said forward direction of a uni-directional wing cross section and an upper curve of said backward direction of a uni-directional wing cross section;

said bi-directional airfoil means having lobe means caused by said blunt tip portion of said uni-directional wing cross section;

said bi-directional airfoil means having an transitional curve from said lobe means of one uni-directional wing to a tail of another uni-directional wing and view versa;

said lobe means forming a ring band of plural directional wing means;

with said plural directional wing means, a flying object being able to fly in plural directions.

22. A plural directional wing means according to claim 21 of which said uni-direction wing further comprising a slot slat and a slot flap,

Said slot slat of a forward direction of said uni-directional wing overlapping with said slot flap of said backward direction of said uni-directional wing to form a skirt;

Said slot slat of a backward direction of said uni-directional wing overlapping with said slot flap of said forward direction of said uni-directional wing to form another skirt;

said an envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section forming a main body being made of main planes and slot skirts being made of said slot slats and slot flaps to be said bi-directional airfoil;

said main plane of said bi-direction airfoil form a polygon main plane of said plural directional wing means; said slot skirt forming a polygon skirt ring around said polygon main plane of said plural directional wing means;

Said slot skirt being at ends of said main plane, said slot skirts serving both slot slat, slot flap, fence and empennage; said skirt serving as a slot slat in the upward wind direction, said skirt serving as a slot flap in the downward wind direction, said skirt serving as a fence in the inclined direction of said wind and said skirt serving as a empennage at side direction being relative to said wind direction.

23. A plural directional wing means according to claim 21, said plural directional wing being in a circular disk shape wing, said circular disk shape wing having any section view crossing a center of said disk to be a cross section being an envelop of a forward direction of a uni-

directional wing cross section and a backward direction of a uni-directional wing cross section, there being transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section;

a ring band being made of said lobe being at bottom of said disk to generate aerodynamic lift for said disk.

24. A plural directional wing means according to claim 21, said wing being in a ring shape wing, said ring shape wing having section view crossing a center of said ring to be a cross section being an envelop of a forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section, there being transitional smooth curves between said forward direction of a uni-directional wing cross section and a backward direction of a uni-directional wing cross section;

two ring band being made of said lobe being at bottom of said disk to generate aerodynamic lift for said ring.

25 . A plural directional wing means according to claim 23, of which said disk means being a boomerang diskring means,

said diskring means having a central hole in said disk means;

a boomerang being at a center portion in said hole of said disk means, said boomerang being constituted of a plural of branches.

Said branch having one end joining at center of said disk means and another end being attaching to said disk along edge of said hole.

26. A plural directional wing means according to claim 24, of which said disk means being a boomerang ringdisk means,

a boomerang being at a center portion of said ring means, said boomerang being constituted of a plural of branches.

Said branch having one end joining at center of said ring means and another end being attaching to said disk along an interior edge of said ring means.

27. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means by hands and said club means for being swiveled with hands to rotate said flying means and throwing said flying means to fly,

said club means being constituted of a pole means for being swiveled with hands in a circle to throw said flying means to fly and a head means for said flying means being pivotally mounted and said flying means being thrown out to rotate to fly in sky,

said flying means rotating and being thrown to fly in sky and a fitting means for said flying means being pivotally mounting on said head means of club means, said pivotally mounting being eccentric to said flying means that said flying means pivotally rotating due to an eccentric force of said swivel of pole means that said rotation of flying means being in parallel to a plane of said swivel of said club means, said fitting means being pivotally rotating on said head means and changing directional relation with said head means as said pole means being swiveled with hands; said flying means with said fitting means being pivotally mounted on said head means and having frictionless lock and release with said head means and being launched to fly with said head means based on said directional relation between said head means and fitting means;

said head means being located at an end portion of said pole means that said disk means being mounted at an end portion of said club means;

said flying means rotating due to said eccentric force of said swivel of club means that said fitting means pivotally rotating to an position to unlock said frictionless lock with said head means that said disk means being released and being launched to fly at said position;

said fitting means and head means not only serving as a pivotally rotation but also serving a directional lock and release; with a directional lock and release mechanism being embedded between said head means and fitting means, swiveling said pole means of said club means, said flying means automatically rotating toward outside of said circle due to said eccentric force, said automatically rotating of said flying means changing directional relation with said head means from said lock to release of said directional lock and release mechanism that said head means releasing said fitting means to launch said flying means to fly,

swiveling said club means in a circle with hand, said club means transferring momentum and an eccentric force to said flying means to rotate said flying means to a new direction to release said lock; with said momentum transfer, said eccentric force causing pivotal rotation and generating gyroscopic force to stabilize said flying means flying and said pivotal rotation of said flying means causing said directional lock and release mechanism of said fitting means and head means from lock to release, said flying means being driven to fly in a long distance with a swivel of said club means.

28. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27 of which said head being in the shape of the golf head, a side of said

head to launch said flying means to fly and other side to play golf ball as conventional golf club does.

29. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27 of which said fit means and head means being screw means;

a screw means of said flying means being screwed on said a screw means of said head means of said club means;

said screw means of said flying means rotating and dangling on said screw means of said head means of said club means;

swiveling said club means, said flying means rotating outward due to said eccentric force, said rotating outward movement of said flying means unscrewing said flying means from said head means of said club means; said screw means of said head means of said club means transferring momentum to said flying means through said screw means of said flying means;

said screw means of said head means of said club means releasing engagement of said screw means of said flying means, said flying means taking off from said head means of said club means and flying in sky.

30. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27 of which said fit means being female screw and head means being male screw;

said female screw means being embedded in said flying means, it reducing air drag to said flying means to increase throwing distance of said flying means.

31. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, a light means and sound means being installed in the middle of said female screw, and said male screw being empty in the middle portion;

said light means and sound means being embedded in a cavity of said female screw not only to reduce air drag to increase throwing distance of said flying means but also having weight balance for said flying means.

32. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a golfball means,

Said golfball means comprising a ball means and a stick means,

said fit means being mounted on an end of said stick means, an other end of said stick means being inserted in said ball means;

swiveling said club means, due to eccentric force, said ball means and said stick means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said golfball means, said golfball means being thrown in the sky,

33. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a multi-boomerang means,

said multi-boomerang means further comprising multi-branches jointing together at a central joint,

said fitting means being mounted at said multi-boomerang means,

swiveling said club means, due to eccentric force, said multi-boomerang means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said multi-boomerang means, said multi-boomerang means being thrown to fly in the sky,

34. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a polygon boomerang means,

said boomerang means further comprising a plural of branches jointing together to form a polygon,

said fitting means being mounted at joint of said branches.

swiveling said club means, due to eccentric force, said polygon boomerang means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said polygon boomerang means, said polygon boomerang means being thrown to fly in the sky,

35. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a disk means;

said fitting means of said flying means being mounted eccentric of said disk means.

swiveling said club means, due to eccentric force, said disk means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a



straight extension line of said club means, said directional lock and release mechanism

releasing said disk means, said disk means being thrown to fly in the sky.

36. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, of which said flying means being a ring means.

said fitting means of said flying means being mounted eccentric on said ring means.

swiveling said club means, due to eccentric force, said ring means being swiveled to rotate toward outside of said swiveling circle with said fit means being a rotational center, around a straight extension line of said club means, said directional lock and release mechanism releasing said ring means, said disk means being thrown to fly in the sky.

37. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, a plastic injection module for said flying means comprising a screw module and a main plane cavity module, said screw module rotates to retrieve from said main plane cavity module before said plastic injection module being open.

38. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 27, said flying object being made of three composite material,

a main plane means of said flying means being made of the elastic material;

an exterior means of said flying means being made of soft material and

said fitting means being made of hard material.

39. A sport means comprises of a flying means for being thrown to fly with a swivel of a club means according to claim 39 further comprising a backbone plate means, said backbone plate

means being integrated with said fitting means and said fitting means and backbone plate means being made of hard material.

40. A sport means comprises of a flying disk means for being thrown to fly with a swivel of a club means by hands and said club means for being swiveled with hands to rotate said flying disk means and throwing said disk means to fly,

said club means being constituted of a pole means for being swiveled with hands in a circle to throw said flying disk means to fly and a head means for said flying disk means being pivotally mounted and said flying disk means being thrown out to rotate to fly in sky,

said flying disk means rotating and being thrown to fly in sky and a fitting means for said flying means being pivotally mounting on said head means of club means, said pivotally mounting being eccentric to said flying disk means that said flying means pivotally rotating due to an eccentric force of said swivel of pole means that said rotation of flying disk means being in parallel to a plane of said swivel of said club means, said fitting means being pivotally rotating on said head means and changing directional relation with said head means as said pole means being swiveled with hands; said flying means with said fitting means being pivotally mounted on said head means and having frictionless lock and release with said head means and being launched to fly with said head means based on said directional relation between said head means and fitting means;

said head means being located at an end portion of said pole means that said disk means being mounted at an end portion of said club means;

said flying disk means rotating due to said eccentric force of said swivel of club means that said fitting means pivotally rotating to an position to unlock said frictionless lock with said head means that said disk means being released and being launched to fly at said position;

said fitting means and head means not only serving as a pivotally rotation but also serving a directional lock and release; with a directional lock and release mechanism being embedded between said head means and fitting means, swiveling said pole means of said club means, said flying disk means automatically rotating toward outside of said circle due to said eccentric force, said automatically rotating of said flying disk means changing directional relation with said head means from said lock to release of said directional lock and release mechanism that said head means releasing said fitting means to launch said flying means to fly,

swiveling said club means in a circle with hand, said club means transferring momentum and an eccentric force to said flying disk means to rotate said flying disk means to a new direction to release said lock; with said momentum transfer, said eccentric force causing pivotal rotation and generating gyroscopic force to stabilize flying disk means flying and said pivotal rotation of said flying disk means causing said directional lock and release mechanism of said fitting disk means and head means from lock to release, said flying disk means being driven to fly in a long distance with a swivel of said club means.

## ABSTRACT

The golh sport is the golf hybrid of the golfrisbee and golfball. Swiveling the golh club, the golfrisbee or the golfball is thrown to fly. The golfrisbee has many types such as the boomerang, disk, diskring, ringdisk, multi-boomerang diskring and multi-boomerang ring disk, etc. The core technologies of the swiveling club throwing technology and the universal direction wing technology. All the series of the golh products are derived from the versatile combinations of these two key technologies. The golh system comprises the complete set for the course golh, park golh, snow golh, night golh, and the baseball type golh sport named as basedisk. Golh is the hybrid golf comprising the flying golfrisbee and the [rolling] golfball. Basedisk is the golfrisbee sport following the similar game rules of baseball. To make the golh dream come true, the golh system comprises the golh club, sky-ballet golfrisbee, golh lubricant, golh cart, golh trolley, golh bag, golh swing trainer, and the manufacture processes to be an integrated system package. The sky-ballet golfrisbee further comprises a skirt to make it safe for playing in the park. [The golfrisbee of golh will be the human power farthest throw in the world to be the new Guinness world record. The ski golh and basedisk will be the new Olympic sports.]